# Rhode Island Cancer Statistics Review 2002

**A publication of the Rhode Island Cancer Registry, Rhode Island Department of Health, in collaboration with the Hospital Association of Rhode Island**

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The Year 2002 Report of the Rhode Island Cancer Registry has been prepared as an aid to cancer control planning and intervention in the State.

- Chapter 1 presents an overview of Rhode Island's cancer burden over five decades.
- Chapter 2 contains a summary of the state's Cancer Control Plan.
- Chapter 3 reports on progress made in the achievement of key objectives from the Cancer Control Plan.
- Chapter 4 presents official Rhode Island cancer statistics for 1996-2000.
- Chapter 5 contains special reports on cancer rates for municipalities and for Hispanics.
- Chapter 6 lists commonly asked questions and answers about cancer in Rhode Island.



* Co-published in whole or in part as a contribution to *Medicine and Health / Rhode Island* at the time this report was prepared

A Note about the Rhode Island Cancer Registry

The Rhode Island Cancer Registry was established by the Rhode Island General Assembly in 1985. It began collecting reports of newly diagnosed cancers on 1 October 1986. The Registry is funded by the State and by the U.S. Centers for Disease Control and Prevention. It is run collaboratively by the Rhode Island Department of Health (HEALTH) and the Hospital Association of Rhode Island (HARI). The Registry produces official cancer statistics for the State and also supplies cancer data to researchers (using strict guidelines for protecting patient confidentiality). Registry staff provide support to hospital tumor registries and promote American College of Surgeons approved cancer programs in acute care hospitals throughout the State.

# 1 Overview of RI's Cancer Burden

## 1.1 Introduction

*Cancer costs Rhode Island an estimated $545 million yearly.*

Working from American Cancer Society estimates for the nation as a whole, and prorating them on the basis of total population, cancer costs Rhode Island about $545 million per year, about $196 million in direct medical costs, and about $349 million in lost productivity from illness and death. [*Cancer Facts and Figures -- 2002*. Atlanta, GA: American Cancer Society, 1998.]

*About 6300 Rhode Islanders get cancer yearly (including in situ as well as invasive tumors).*

Four cancers account for most (56 percent) of the cancers diagnosed: cancers of the lung, colon-rectum, breast, and prostate.

*About 2400 Rhode Islanders die of cancer yearly.*

This represents about one-fourth of all deaths in the State. Four cancers account for a majority (51 percent) of all cancer deaths: cancers of the lung, colon-rectum, breast, and prostate.

*Cancer rates vary among the 39 cities and towns in Rhode Island.*

Cancer incidence rates by municipality are available for cancers of the lung, colon, prostate, breast, and all invasive cancers combined. When interpreted judiciously, these rates serve as a good introduction to more comprehensive thinking about the factors that increase and decrease the cancer burden across geographic areas.

*Historically, cancer rates have been higher in Rhode Island than in the United States as a whole.*

Among white men in the 1950's, for example, the cancer death rate was 18% higher in Rhode Island than in the U.S. as a whole.

*This difference has gotten smaller over time.*

Among white men in the 1990's, for example, this difference had declined to 9%.

*Rhode Island has an "urban cancer profile."*

Cancer rates in Rhode Island display an "urban profile," a distinct pattern of higher than average cancer rates related to physical activity, diet, tobacco and alcohol use, and exposures in the workplace.

*African Americans have higher cancer death rates than whites in Rhode Island.*

The age-adjusted death rate from all cancers combined is over one-third higher among African Americans than whites in Rhode Island, even though the incidence rate from all cancers combined is about the same for both groups. This suggests that African Americans do not get the same quality healthcare as whites get.

## 1.2 Reassessing Cancer Mortality in Rhode Island, 1950-1999

[Leanne Chiaverini, B.S., John P. Fulton, PhD]

### 1.2.1 Objectives

The Rhode Island Department of Health (HEALTH) analyzed cancer mortality rates for residents of Rhode Island (RI) and the U.S. as a whole, 1950-1999, to observe trends and to identify causes of death which differentiate RI from the U.S.

### 1.2.2 Background

Previous research[1,2] has established that RI cancer mortality, among the highest in the U.S., displays an "urban profile."[3] In brief, RI, one of the most urban states, has higher than average cancer mortality. When this differential is decomposed, it is found to be caused by cancers of a very few sites, including cancers related to diet, such as cancers of the stomach and colon-rectum, cancers in which diet is implicated, such as cancers of the breast and prostate, and cancers related to tobacco use, such as cancers of the lung-bronchus ("lung"), urinary bladder, esophagus (also related to alcohol use), oral cavity, pharynx, and larynx. The mortality rates from such cancers are elevated in urban areas throughout the developed world.[3]

### 1.2.3 Methods

U.S. cancer mortality rates for 1950-1999 and RI cancer mortality rates for 1950-1979 were obtained from published statistics.[4,5] RI cancer mortality rates for 1980-1999 were derived from vital records and from U.S. Census data. All rates, published and derived, are directly standardized for age, using the 1970 population of the U.S. as the standard population, are specific for race, decade, and gender, and are expressed as "average annual deaths per 100,000 population per year."

Rates for African Americans were not available for the years 1950-1979. African American rates for individual cancer sites were not used because the RI rates, based on small numbers, are associated with large standard errors.

### 1.2.4 Results

*Mortality Trends for All Cancers Combined*

The RI/US cancer mortality differential among whites has persisted from the 1950s through the 1990s, although it has steadily declined (Table 1.1). The differential has been greater for males than females.

Trends in mortality from all cancers combined among white males were similar in both geographical areas during the period of observation (Table 1.1). White male mortality from all cancers combined increased from 1950 through 1989, then decreased dramatically in the 1990-1999 period.

Although white female all-cancer mortality rates from 1950 through 1989 were higher in RI than in the U.S., trends were similar in both geographical areas. They decreased from the 1950s to the 1960s, varied little from the 1960s to the 1970s, and increased in the 1980s. In the 1990s, the RI/US differential was further reduced as RI rates declined and U.S. rates increased.

*The Role of Lung Cancer*

Among white males, mortality rates for all cancers combined reflect the trend in cancers of the lung. White males experienced substantial mortality from cancers of the lung in the 1950s, and rates increased through the 1980s. A decrease in white male lung-cancer mortality in the 1990s was accompanied by the first decrease in all-cancer mortality since the 1950s. Among white males, the RI/US differential in mortality from cancers of the lung decreased from 1950 to 1989, then increased slightly in the 1990s.

White females, who experienced little mortality from cancers of the lung in the 1950s, had a substantial increase in lung cancer mortality in the 1990s. Lung cancer mortality rates for RI were below those of the nation until the 1980s, when RI surpassed the U.S. and created a growing differential.

# 2 1998 Rhode Island Cancer Control Plan Executive Summary

*Rhode Island bears a heavy cancer burden.*

About 5000 new cases of cancer occur in Rhode Island each year, and about 2500 cancer victims die of the disease. About one-fourth of all deaths in the State are from cancer. At any one time about 33,000 Rhode Islanders are either fighting the disease or have fought it in years past. Cancer costs the State an estimated $453 million per year in medical costs and lost opportunity costs.

*RI has higher than average cancer rates.*

Rhode Island has higher than average cancer rates, when compared with other states in the U.S. Although this difference has gotten smaller over time, cancer death rates in Rhode Island are still about ten percent higher than mortality rates for the U.S. as a whole.

*RI has an "urban cancer profile."*

Rhode Island's cancer rates have an "urban profile." Like other "city-like" places in the developed world, Rhode Island has higher than average death rates from cancers related to diet, such as cancers of the colon, rectum, and stomach, cancers in which diet is implicated, such as cancers of the breast and prostate, and cancers related to tobacco use, such as cancers of the lung and bronchus, urinary bladder, esophagus (also related to alcohol use), oral cavity, pharynx, and larynx.

*Cancer rates are not the same for all people.*

In Rhode Island, African Americans are much more likely than whites to die of cancer. In the 1980's, for example, African American men experienced a 39 percent higher cancer mortality rate than white men, and African American women experienced a 35 percent higher cancer mortality rate than white women.

*We can do more to prevent cancer.*

Rhode Islander's have made some progress in adopting behaviors that prevent cancer. Fewer adults are smoking. Slightly more adults are getting regular physical activity. We must do more than this, however. We must stop smoking, eat more fruits and vegetables, get more regular exercise like walking, and protect our skin from too much sun.

*We can do more to find cancer early.*

More women ages 45 and over are getting Pap tests, and more women ages 40-49 are getting mammograms. We must do much more than this, however.

- To find cancer of the cervix early, all sexually active women should get regular Pap tests. Many should get Pap tests every year.
- To find cancer of the breast early, women ages 40 and over must get a physical breast exam and a mammogram every year.
- To find cancer of the colon and rectum early, people ages 40 and over should be getting a digital rectal exam every year, and people ages 50 and over should be getting a fecal occult blood test every year and sigmoidoscopy every five years.

*We must reduce barriers to cancer control.*

Barriers to cancer control have been identified and must be reduced:

- We have not gotten cancer control messages to people of low socio-economic status ("s.e.s.") properly.
- People of low s.e.s. have poor access to the primary care providers who should counsel them about preventive behaviors and screen them for cancer.
- Clinical trials are not understood by the public and are under-used by physicians.

- Hospice care is under-used. Hospice care that relies on the 24-hour availability of family care givers is not practical for many terminally ill cancer patients, especially those of low s.e.s.

*Cancer surveillance can be improved.*

Cancer surveillance is good in Rhode Island. The Behavioral Risk Factor Surveillance System (BRFSS), the cancer registry, and the vital records system provide essential data on preventive behaviors, cancer screening, new cases of cancer, and cancer deaths. Strategic improvements to cancer surveillance have been suggested:

- Additional cancer control indicators for the BRFSS
- An indicator of enrollment in clinical trials for cancer case reports made to the Rhode Island Cancer Registry
- The reporting of simple statistical information from licensed hospices to the Rhode Island Department of Health on the use of hospice services

*We must work on 6 cancer control priorities.*

Three top priorities have been chosen for immediate intervention and three for additional planning:

...for immediate intervention:

1. Send simple cancer control messages to people of low s.e.s., using culturally relevant messages.
2. Develop primary care resources to meet the cancer control needs of people of low s.e.s.
3. Develop a regular continuing education program for primary care providers to keep them up to date on changing cancer control recommendations.

...for additional planning:

4. Remove barriers to cancer control in primary health care settings, especially those that serve people of low s.e.s.
5. Remove barriers to the use of clinical trials in the treatment of adult cancer patients.
6. Remove barriers to the use of hospice services by terminally ill cancer patients.

*Other Cancers Combined*

Mortality from all cancers except lung decreased steadily from the 1950s through the 1990s among white males and females in both geographical areas. The overall decrease (1950 to 1999) was more dramatic among females than males. The RI/US differential in mortality from cancers except lung decreased for both males and females.

*Specific Sites*

In the 1970s the RI/US cancer mortality differential for white males was caused by cancers of eight sites (Table 1.2), including two strongly related to diet (colon-rectum and stomach), one for which diet is implicated (prostate), and five strongly related to the use of tobacco (lung-bronchus, urinary bladder, esophagus, oral cavity and pharynx, and larynx). In the 1980s the RI/US mortality differential for white males was caused by cancers of ten sites, including the eight 1970s' sites, plus cancer of the brain and melanomas of skin. In the 1990s, a small differential for lymphoma was also observed among white males. No other differentials greater than 1/100,000 were observed for cancers of other specific sites in any of the three decades.

The RI/US cancer mortality differential for white females was caused by cancers of the same three sites in the 1970s and the 1980s (Table 1.2), including two strongly related to diet (colon-rectum and stomach), and one for which diet is implicated (breast). RI/US differentials for white females in the 1990s additionally included lung cancer. No other differentials greater than 1/100,000 were observed for cancers of other specific sites in any of the three decades.

All differentials initially observed in the 1970s persisted into the 1990s. Differentials for cancers of the brain/ nervous system and melanomas of the skin, which were observed for the first time in the 1980s, following well-documented increases in the incidence of both throughout the U.S. from 1970 to 1989[6], then decreased significantly in the 1990s. The mortality differential for melanomas of the skin reversed in the 1990s, as U.S. rates exceeded RI rates.

*Racial Disparities*

Among African Americans of both genders, mortality in the 1980s and 1990s from all cancers combined was higher in RI than the U.S. (Table 1.3). In both areas, mortality was substantially higher among African Americans than among whites, regardless of gender.

### 1.2.5 Discussion

Even though the RI/US cancer mortality differential diminished steadily over the 50 years of observation, RI continues to exhibit an urban cancer profile. Cancers related to tobacco use and diet predominate among cancer sites contributing to the RI/US differential.

Lung cancer was largely responsible for the trends in all-cancer mortality among whites between 1950 and 1999. Recent increases in lung cancer mortality among white women will likely continue in coming years.

### 1.2.6 References

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### 1.2.7 Tables

Table 1.1. Death rates, whites, Rhode Island and the U.S., 1950-1999, by gender, cancer site, and decade

| | Males | | | Females | | |
|---|---|---|---|---|---|---|
| Cancer Site and Decade | RI | US | RI/US | RI | US | RI/US |
| All Cancers | | | | | | |
| 1950-1959 | 208.0 | 176.6 | 1.18 | 157.8 | 141.6 | 1.11 |
| 1960-1969 | 224.5 | 190.0 | 1.18 | 145.1 | 132.4 | 1.10 |
| 1970-1979 | 236.9 | 204.1 | 1.16 | 144.9 | 131.7 | 1.10 |
| 1980-1989 | 240.5 | 212.2 | 1.13 | 149.8 | 137.1 | 1.09 |
| 1990-1999 | 221.5 | 204.0 | 1.09 | 147.3 | 138.0 | 1.07 |
| Lung and Bronchus | | | | | | |
| 1950-1959 | 34.6 | 29.6 | 1.17 | 4.4 | 5.1 | 0.86 |
| 1960-1969 | 53.5 | 46.8 | 1.14 | 7.4 | 7.6 | 0.97 |
| 1970-1979 | 71.7 | 64.0 | 1.12 | 15.2 | 15.3 | 0.99 |
| 1980-1989 | 76.3 | 71.9 | 1.06 | 26.7 | 26.0 | 1.03 |
| 1990-1999 | 73.5 | 68.1 | 1.08 | 35.6 | 34.1 | 1.04 |
| All Except Lung and Bronchus | | | | | | |
| 1950-1959 | 173.4 | 147.0 | 1.18 | 153.4 | 136.5 | 1.12 |
| 1960-1969 | 171.0 | 143.2 | 1.19 | 137.7 | 124.8 | 1.10 |
| 1970-1979 | 165.2 | 140.1 | 1.18 | 129.7 | 116.4 | 1.11 |
| 1980-1989 | 164.2 | 140.3 | 1.17 | 123.1 | 111.1 | 1.11 |
| 1990-1999 | 148.0 | 135.9 | 1.09 | 111.7 | 103.9 | 1.08 |

Note: Rates are average annual, age-standardized, using the 1970 U.S. population as standard, expressed as deaths per 100,000 population.

Table 1.2. Death rates, selected cancers, whites, Rhode Island and the U.S., 1970-1999, by decade and sex

| | RI | | | US | | |
|---|---|---|---|---|---|---|
| Sex and Cancer Site | 1970-1979 | 1980-1989 | 1990-1999 | 1970-1979 | 1980-1989 | 1990-1999 |
| Males | | | | | | |
| All Sites | 236.9 | 240.5 | 221.5 | 204.1 | 212.2 | 204.0 |
| Lung/bronchus | 71.7 | 76.3 | 73.5 | 64.0 | 71.9 | 68.1 |
| Colon/rectum | 35.8 | 33.2 | 25.0 | 25.8 | 24.8 | 20.8 |
| Prostate | 21.7 | 22.9 | 23.2 | 20.3 | 21.9 | 22.4 |
| Stomach | 12.7 | 10.0 | 8.1 | 9.0 | 6.9 | 5.3 |
| Urinary bladder | 10.3 | 7.9 | 6.7 | 7.3 | 6.2 | 5.7 |
| Brain/nervous system | N/A | 6.4 | 5.5 | N/A | 5.2 | 5.4 |
| Esophagus | 6.2 | 6.2 | 6.7 | 4.4 | 4.8 | 5.7 |
| Oral cavity/pharynx | 8.0 | 5.6 | 4.0 | 5.6 | 4.6 | 3.7 |
| Melanomas of skin | N/A | 5.3 | 2.9 | N/A | 3.1 | 3.5 |
| Larynx | 3.9 | 4.0 | 3.1 | 2.7 | 2.4 | 2.1 |
| Sum of selected sites | 170.3 | 177.8 | 158.7 | 139.1 | 151.8 | 142.7 |
| All other sites | 66.6 | 62.7 | 62.8 | 65.0 | 60.4 | 61.3 |
| Females | | | | | | |
| All Sites | 144.9 | 149.8 | 147.3 | 131.7 | 137.1 | 138.0 |
| Breast | 31.4 | 31.1 | 27.1 | 27.0 | 27.2 | 24.5 |
| Colon/rectum | 26.6 | 20.8 | 15.8 | 19.8 | 17.2 | 14.0 |
| Stomach | 5.6 | 4.3 | 3.6 | 4.3 | 3.1 | 2.4 |
| Sum of selected sites | 63.6 | 56.2 | 46.5 | 51.1 | 47.5 | 40.9 |
| All other sites | 81.3 | 93.6 | 100.8 | 80.6 | 89.6 | 97.1 |

Note: Rates are average annual, age-standardized, using the 1970 U.S. population as standard, expressed as deaths per 100,000 population.

Table 1.3. Death rates, all cancers combined, Rhode Island and the U.S., 1980-1999, by sex, decade, and race

| | Males | | | Females | | |
|---|---|---|---|---|---|---|
| Decade and Race | RI | US | RI/US | RI | US | RI/US |
| 1980-1989 | | | | | | |
| Blacks | 333.1 | 306.3 | 1.09 | 202.2 | 161.2 | 1.25 |
| Whites | 240.5 | 212.2 | 1.13 | 149.8 | 137.1 | 1.09 |
| African Americans / Whites | 1.39 | 1.44 | 0.96 | 1.35 | 1.18 | 1.15 |
| 1990-1999 | | | | | | |
| Blacks | 304.0 | 299.0 | 1.09 | 208.0 | 166.6 | 1.25 |
| Whites | 221.5 | 204.0 | 1.09 | 147.3 | 138 | 1.07 |
| African Americans / Whites | 1.37 | 1.47 | 1.00 | 1.41 | 1.21 | 1.17 |

Note: Rates are average annual, age-standardized, using the 1970 U.S. population as standard, expressed as deaths per 100,000 population.

# 3 Progress Controlling Cancer in RI, 1987-2000

This chapter contains progress reports on the control of five cancers:

- Progress in the Control of Female Breast Cancer in Rhode Island, 1987-2000
- Progress in the Control of Cervical Cancer in Rhode Island, 1987-2000
- Progress in the Control of Colorectal Cancer in Rhode Island, 1987-2000
- Progress in the Control of Lung Cancer in Rhode Island, 1987-2000
- Progress in the Control of Prostate Cancer in Rhode Island, 1987-2000

## 3.1 Progress in the Control of Female Breast Cancer in Rhode Island, 1987-2000

[John P. Fulton, Ph.D., Leanne Chiaverini, B.S., Dorothy M. Darcy, A.S., CTR]

### 3.1.1 Profile

In Rhode Island, about 9000 women have been diagnosed with breast cancer (8,922 in 1998), about 1000 women are newly diagnosed with breast cancer each year (1,004 in 2000), and about 200 succumb to the disease annually (180 in 1999). Breast cancer is among the top four most prevalent cancers in the state (and the nation), along with cancers of the lung, colon-rectum, and prostate. In Rhode Island, breast cancer accounted for 16 percent of all newly diagnosed cancers in 2000 (including male as well as female cases), and seven percent of all cancer deaths in 1999.

### 3.1.2 Control Strategy

Although breast cancer has been linked to a variety of risk factors, effective preventives are unknown. A number of clinical trials and clinical-trial-like studies have demonstrated the effectiveness of screening for the reduction of breast cancer mortality, but in recent years, the quality of these studies and the validity of their results have been questioned. (1,2) Despite the recent controversies associated with screening, its aggressive use remains a key control strategy, along with the assurance of multidisciplinary, state-of-the-art treatment. The Rhode Island Cancer Control Plan, (3) published in September, 1998, recommends:

*Breast Cancer Screening*

- For women without a family history of pre-menopausal breast cancer, a clinical breast exam (CBE) should be performed at the periodic health examination after the age of 30.
- Annual CBE and mammography after age 40.
- For women with a first degree relative diagnosed with pre-menopausal breast cancer, annual mammography should commence 5-10 years prior to the age at which the relative was diagnosed.
- Women with BRCA1 and BRCA2 mutations should commence monthly Breast Self Exam by 20 years of age, and should receive annual or semiannual CBE, and annual mammography, beginning at age 25 to 35 years.

*Basic Treatment Infrastructure*

- Promote and support the adoption of American College of Surgeons (ACOS) approved cancer programs in all acute care hospitals in Rhode Island.
- Assure accurate tumor staging with American Joint Committee on Cancer (AJCC) staging methodology.

### 3.1.3 2010 Targets

*Healthy People 2010*, the most recent set of health objectives for the United States, (4) suggests the following targets for the control of breast cancer:

*Screening*

By 2010, increase the proportion of women ages 40 years and older who have received a mammogram within the preceding 2 years to 70 percent (baseline = 67 percent in 1998).

*Mortality*

By 2010, reduce the breast cancer death rate to 22.3 deaths per 100,000 females (age-adjusted to the year 2000 standard population of the United States; baseline = 27.9 deaths per 100,000 females in 1998).

### 3.1.4 Trends

(Please refer to Table 3.1.)

*Screening*

The proportion of Rhode Island women ages 40 years and older of all races who had received a mammogram within the preceding 2 years increased from 71 percent in 1990 to 84 percent in 2000. Among all the states, in comparison, the median proportion of women ages 40 years and older of all races who had received a mammogram within the preceding 2 years increased from 58 percent in 1990 to 76 percent in 2000.

*Incidence*

The age-adjusted incidence of invasive breast cancer (2000 standard) among Rhode Island women of all races stayed about the same from 1987 to 2000, hovering around 130 cases per 100,000 women (based on five-year moving averages). In contrast, the age-adjusted incidence of invasive breast cancer (2000 standard) among U.S. women of all races increased from about 131 cases per 100,000 women in 1987-1991 to about 137 cases per 100,000 women in 1995-1999.

In Rhode Island, the analogous rates for *in situ* breast cancer doubled over the 1987-2000 period, increasing steadily from 15 cases per 100,000 women in 1987-1991 to 29 cases per 100,000 women in 1996-2000. As well, when age-adjusted incidence rates of invasive cancer are broken down by stage of disease at diagnosis, one may observe an increase in the incidence of local tumors (from 77 per 100,000 women in 1987-1991 to 83 per 100,000 women in 1996-2000), and a decrease in the incidence of regional tumors (from 42 per 100,000 women in 1987-1991 to 37 per 100,000 women in 1996-2000). The age-adjusted incidences of distant tumors and tumors of unknown stage both hovered around 6-7 per 100,000 women for the entire period of observation.

*Basic Treatment Infrastructure*

From 1989 through 1996, about half of the breast cancer cases newly diagnosed among Rhode Island women were treated under the auspices of six in-state ACOS-approved hospital cancer programs. Another program was approved in 1997, and two more in 2000, bringing the total to nine. With these additions, and with changes in the distribution of breast cancer cases among hospitals, the proportion of newly diagnosed breast cancer cases treated under in-state ACOS-approved programs had increased to 82 percent by 2000.

Prior to a change in the Rules and Regulations of the Rhode Island Cancer Registry in 1992, only about 75 percent of the breast cancer cases newly diagnosed among Rhode Island women were staged using the AJCC system, an important basis for choosing appropriate treatments. After the Rules change, the proportion of cases with AJCC staging increased to 90 percent, and has averaged 93 percent from 1993 through 2000.

*Mortality*

The age-adjusted mortality of invasive breast cancer (2000 standard) among Rhode Island women of all races declined from 37 per 100,000 in 1987-1991 to 31 per 100,000 in 1995-1999 (based on five-year moving averages). Similarly, the age-adjusted mortality of invasive breast cancer (2000 standard) among U.S. women of all races declined from 33 in 1987-1991 to 29 in 1995-1999 (based on five-year moving averages). The rates in Rhode Island were higher than the rates in the U.S. as a whole throughout the period of observation.

### 3.1.5 Assessment

The health care community in Rhode Island has aggressively promoted breast cancer screening since 1986. As a result, Rhode Island is ahead of the nation in breast cancer screening, and by 2000 had already exceeded the *Healthy People 2010* goal by 20 percent.

Gains have also been made toward the achievement of basic treatment infrastructure goals as set forth in the second (1998) edition of the state's cancer control plan. The proportion of newly diagnosed breast cancer cases treated under the auspices of in-state ACOS-approved hospital cancer programs increased from 51 percent to 82 percent during the period of observation, and the proportion of cases staged with AJCC methodology increased from 73 percent to 95 percent.

In Rhode Island, increased use of mammography in the 1990s was accompanied by increased incidence of *in situ* and localized breast tumors, decreased incidence of regional and distant breast tumors, and decreased breast cancer mortality. The increased use of mammography may have contributed to the observed trends in breast cancer incidence and mortality, although multiple factors were undoubtedly at play. Advances in treatment, for example, may have contributed substantially to the decrease in breast cancer mortality.

The *Healthy People 2010* goal for breast cancer mortality is very aggressive. Given the current level of breast cancer mortality in Rhode Island and its trend during the 1990s, public health efforts may have to go beyond the continued promotion of screening mammography, whatever its effectiveness in reducing breast cancer mortality, to achieve the *Healthy People 2010* goal. Given that effective preventive measures for breast cancer are unknown, the only remaining strategy with promise for the reduction of breast cancer mortality is the aggressive promotion, use, and evaluation of state-of-the-art breast cancer therapy, including the aggressive enrollment of patients in approved clinical trials.

### 3.1.6 References


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### 3.1.7 Table 3.1

Table 3.1. Progress in the control of breast cancer among females:

- % women ages 40+ who have had a mammogram in the past two years
- Average annual age-adjusted breast cancer incidence rates by summary stage of disease at diagnosis among women of all races
- % cases in RI ACOS-approved treatment programs, of cases with AJCC staging, and of localized cases with recommended treatment
- Average annual breast cancer mortality rates among women of all races

| Place | Measure | Source | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RI | % Ages 40+ Screened * | [a] | NA | 71 | 71 | 66 | 73 | NA | 72 | 76 | 81 | 80 | 83 | 84 |
| U.S. | % Ages 40+ Screened | | NA | 58 | 62 | 63 | 66 | 67 | 69 | 69 | 70 | 72 | 73 | 76 |
| RI | Incidence - In Situ ** | [b] | 14.6 | 15.2 | 15.9 | 16.6 | 17.3 | 18.5 | 19.9 | 22.2 | 25.3 | 28.6 | | |
| RI | Incidence - Local | [b] | 77.1 | 77.3 | 77.5 | 77.5 | 78.3 | 78.7 | 79.9 | 81.3 | 82.1 | 82.7 | | |
| RI | Incidence - Regional | [b] | 42.5 | 41.9 | 40.8 | 39.3 | 38.4 | 38.0 | 37.1 | 36.3 | 36.3 | 36.7 | | |
| RI | Incidence - Distant | [b] | 6.8 | 6.5 | 6.3 | 6.4 | 6.7 | 6.9 | 6.6 | 6.4 | 5.9 | 5.4 | | |
| RI | Incidence - Unknown Stage | [b] | 6.1 | 5.9 | 5.5 | 5.6 | 6.4 | 7.0 | 7.2 | 7.2 | 7.2 | 6.4 | | |
| RI | Incidence - All Invasive *** | [b] | 132.6 | 131.5 | 130.1 | 128.8 | 129.9 | 130.6 | 130.8 | 131.2 | 131.5 | 131.1 | | |
| U.S. | Incidence - All Invasive | [c] | 131.5 | 131.1 | 130.7 | 131.4 | 131.6 | 131.6 | 132.7 | 135.0 | 136.6 | NA | | |
| RI | % Cases in RI ACOS Tx Pgms | [b] | 51 | 51 | 50 | 47 | 55 | 57 | 52 | 54 | 62 | 68 | 70 | 82 |
| RI | % Cases with AJCC Staging | [b] | 73 | 74 | 71 | 75 | 90 | 93 | 93 | 94 | 92 | 92 | 92 | 95 |
| RI | Mortality | [d] | 37.2 | 37.9 | 36.5 | 35.6 | 35.2 | 34.2 | 32.2 | 32.2 | 31.1 | NA | | |
| U.S. | Mortality | [d] | 33.0 | 32.9 | 32.5 | 32.1 | 31.6 | 31.0 | 30.4 | 29.6 | 28.8 | NA | | |

* Percentage of women ages 40 and over who have had a mommogram in the past two years

** Incidence and mortality rates are based on five years' data (e.g., 1989 = 1987-1991; 1998 = 1997-2000), age adjusted to the 2000 U.S. standard population, expressed as cases per 100,000.

*** Invasive includes the following stages of disease at diagnosis: local, regional, distant, and unknown

[a] Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention

[b] Rhode Island Cancer Registry, Rhode Island Department of Health

[c] National Cancer Institute. *SEER Cancer Statistics Review 1973-1999*. Bethesda, MD: National Cancer Institute, 2002.

[d] CDC Wonder, Centers for Disease Control and Prevention

NA Data not available or not applicable

## 3.2 Progress in the Control of Cervical Cancer in Rhode Island, 1987-2000

[Leanne Chiaverini, B.S., John P. Fulton, Ph.D., Dorothy M. Darcy, A.S., CTR]

### 3.2.1 Profile

In Rhode Island, about 800 women have been diagnosed with cervical cancer (837 in 1998), about 50 women are newly diagnosed with cervical cancer each year (46 in 2000), and about 10 succumb to the disease annually (11 in 1999). In Rhode Island, cervical cancer accounted for less than one percent of all newly diagnosed cancers in 2000, and only 0.4 percent of all cancer deaths in 1999. However, given the effectiveness of regular screening with the Pap test, any case of cervical cancer and any death from this disease must be seen as a public health failure.

### 3.2.2 Control Strategy

Several risk factors for cancer of the uterine cervix have been identified. (1) However, the most clinically significant strategy for the reduction of cervical cancer is use of the Pap test (Pap smear), a noninvasive, inexpensive, simple screening procedure that allows physicians to find and treat precancerous dyplasias and localized tumors. The effectiveness of screening with the Pap test for the reduction of cervical cancer mortality has been demonstrated by several studies. (2) Although reports of high false-negative and false-positive rates have caused the accuracy of the Pap test to be questioned, the rescreening of smears and the development of computer-based automated technology have reduced the proportion of false results. (3) Aggressive use of the Pap test remains a key control strategy accompanied by multidisciplinary, state-of-the-art treatment, if necessary. The Rhode Island Cancer Control Plan, (4) published in September, 1998, recommends:

*Cervical Cancer Screening*

- For women in high risk groups -- women with multiple sex partners, sexually promiscuous partners, early age at first intercourse, and/or a history of a sexually transmitted disease (including human papilloma virus) -- Pap smears should be performed annually.
- For women who are HIV positive, Pap smears should be performed at least annually.
- For asymptomatic women with a cervix and no risk factors, regular Pap smears should be performed if a woman is or has been sexually active. There is no upper age limit for the performance of regular Pap smears.
- If a history of past and/or present sexual activity cannot be accurately determined and a woman is 18 years of age or over, routine Pap screening should be initiated.
- Women who have had a hysterectomy cannot be presumed to be without cervical tissue and the decision to screen them with Pap smears should be determined on a case by case basis.

*Basic Treatment Infrastructure*

- Promote and support the adoption of American College of Surgeons (ACOS) approved cancer programs in all acute care hospitals in Rhode Island.
- Assure accurate tumor staging with American Joint Committee on Cancer (AJCC) staging methodology.

### 3.2.3 2010 Targets

*Healthy People 2010*, the most recent set of health objectives for the United States, (2) suggests the following targets for the control of cervical cancer:

*Screening*

By 2010, increase the proportion of women aged 18 years and older who have ever received a Pap test to 97 percent (baseline = 92 percent in 1998), and increase the proportion of women aged 18 years and older who have received a Pap test within the preceding 3 years to 90 percent (baseline = 79 percent in 1998).

*Mortality*

By 2010, reduce the cervical cancer death rate to 2.0 deaths per 100,000 females (age-adjusted to the year 2000 standard population of the United States; baseline = 3.0 deaths per 100,000 females in 1998).

### 3.2.4 Trends

(Please refer to Table 3.2.)

*Screening*

The proportion of Rhode Island women of all races, aged 18 years and older, who had received a pap test within the preceding 3 years increased from 80 percent in 1992 to 89 percent in 2000. Among all the states, in comparison, the median proportion of women of all races, aged 18 years and older, who had received a pap test within the preceding 3 years increased from 84 percent in 1992 to 87 percent in 2000.

*Incidence*

The age-adjusted incidence of invasive cervical cancer (2000 standard) among Rhode Island women of all races was 10.0 cases per 100,000 women in 1987-1991, peaked at 11.8 cases per 100,000 women in 1992-1996, then returned to 9.7 cases per 100,000 in 1996-2000 (based on five-year moving averages). In contrast, the age-adjusted incidence of invasive cervical cancer (2000 standard) among U.S. women of all races decreased from 10.4 cases per 100,000 women in 1987-1991 to 9.0 cases per 100,000 women in 1995-1999.

When age-adjusted incidence rates of invasive cervical cancer are broken down by stage of disease at diagnosis, the incidence of local tumors peaked in the mid-1990's (from 4.8 cases per 100,000 women in 1987-1991 to 6.4 cases per 100,000 women in the mid-1990's to 5.1 cases per 100,000 women in 1996-2000). There was no significant change in the incidence of regional tumors until it declined slightly from 3.0 cases per 100,000 women in 1993 to 2.4 cases per 100,000 women in 1998 (based on five-year moving averages). Age-adjusted incidence rates for both distant tumors and tumors of unknown stage hovered around 1 case per 100,000 women.

> [*Note:* Adoption of the Bethesda System for classifying cervical cytology in the late 1980s made it impossible to distinguish *in situ* cervical cancer from high grade cervical dysplasias. Thus, cancer case reports for *in situ* tumors accepted after that time must be considered suspect. Recognition of this fact led to the termination of such reports by cancer registries around the country in 1996.]

*Basic Treatment Infrastructure*

From 1989 through 1996, the percentage of Rhode Island women newly diagnosed with cervical cancer who were treated under the auspices of in-state ACOS-approved hospital cancer programs averaged 28 percent. The addition of a program in 1997 and two more in 2000 brought the proportion of newly diagnosed cervical cancer cases treated under ACOS-approved programs to 73 percent among Rhode Island women in 1997 and 96 percent in 2000.

Prior to a change in the Rules and Regulations of the Rhode Island Cancer Registry in 1992, only about 76 percent of the cervical cancer cases newly diagnosed among Rhode Island women were staged using the AJCC system, an important basis for choosing appropriate treatments. After the Rules change, the proportion of cases with AJCC staging increased to 84 percent, and has averaged 91 percent from 1993 through 2000.

*Mortality*

The age-adjusted mortality of invasive cervical cancer (2000 standard) among Rhode Island women of all races hovered around 3 cases per 100,000 women for the entire period of observation (based on five-year moving averages). The age-adjusted mortality of invasive cervical cancer (2000 standard) among U.S. women of all races experienced a small but steady decline from 3.6 cases per 100,000 women in 1987-1991 to 3.1 cases per 100,000 women in 1995-1999 (based on five-year moving averages).

### 3.2.5 Assessment

Gains have been made toward the achievement of basic treatment infrastructure goals as set forth in the second (1998) edition of the state's cancer control plan. The proportion of newly diagnosed cervical cancer cases treated under the auspices of in-state ACOS-approved hospital cancer programs increased from 32 percent to 96 percent

during the period of observation. The proportion of cases staged with AJCC methodology increased from 72 percent in 1989 to 84 percent in 1993, and averaged 91 percent from 1993 through 2000.

In Rhode Island, increased use of the Pap smear in the 1990s was accompanied by a small peak in the incidence of invasive cervical cancer among women. The incidence of local and regional cervical tumors followed a similar pattern. There was no significant change in the incidence of distant cervical tumors and tumors of unknown stage, and little change occurred in cervical cancer mortality.

The Pap test is a known effective preventive for cervical cancer. Its aggressive promotion and use, followed by state-of-the-art cervical cancer therapy, if necessary, are important for the control of cervical cancer. However, given the obscure trend in cervical cancer incidence and mortality in Rhode Island over the past decade, alternative strategies may be necessary to achieve the *Healthy People 2010* goal. Screening programs, using social marketing strategies, should target low income and low education populations who are least likely to have been screened, and older women, who are often diagnosed at a later stage of disease and are more likely to die from the disease than younger women. (2)

### 3.2.6 References


1. National Institutes of Health, National Cancer Institute. Cancer Rates and Risks. 4th edition, 1996.

2. U.S. Department of Health and Human Services. *Healthy People 2010*. 2nd ed. With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington, DC: U.S.Government Printing Office, November 2000.

3. Ku NN. Automated Papanicolau smear analysis as a screening tool for female lower genital tract malignancies. *Curr Opin Obstet Gynecol*. 1999 Feb;11(1):41-3.

4. Rhode Island Department of Health. *Cancer Control Rhode Island – Strategic Plan for 1998-2005*. Providence, RI: Rhode Island Department of Health, September, 1998.


### 3.2.7 Table 3.2

Table 3.2. Progress in the control of cervical cancer:

- % women who have had a Pap smear within the past three years
- Average annual age-adjusted cervical cancer incidence rates by summary stage of disease at diagnosis among women of all races
- % cases in RI ACOS-approved treatment programs, of cases with AJCC staging, and of localized cases with recommended treatment
- Average annual cervical cancer mortality rates among women of all races

| Place | Measure | Source | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RI | % Screened * | [a] | | | | 80.0 | 83.9 | NA | 82.9 | 82.9 | 87.4 | 85.2 | 86.0 | 88.5 |
| U.S. | % Screened | | | | | 84.1 | 84.7 | 85.4 | 84.5 | 84.6 | 84.6 | 84.8 | 85.5 | 86.8 |
| RI | Incidence - Local ** | [b] | 4.8 | 5.4 | 5.7 | 6.0 | 6.3 | 6.4 | 6.2 | 5.7 | 5.5 | 5.1 | | |
| RI | Incidence - Regional | [b] | 2.7 | 3.0 | 2.8 | 2.8 | 3.0 | 2.9 | 2.9 | 2.7 | 2.6 | 2.4 | | |
| RI | Incidence - Distant | [b] | 1.1 | 1.0 | 1.0 | 1.1 | 1.2 | 1.4 | 1.5 | 1.5 | 1.5 | 1.4 | | |
| RI | Incidence - Unknown Stage | [b] | 1.4 | 1.5 | 1.4 | 1.2 | 1.1 | 1.1 | 0.9 | 0.8 | 0.9 | 0.8 | | |
| RI | Incidence - All Invasive *** | [b] | 10.0 | 10.8 | 11.0 | 11.2 | 11.6 | 11.8 | 11.4 | 10.7 | 10.4 | 9.7 | | |
| U.S. | Incidence - All Invasive | [c] | 10.4 | 10.4 | 10.2 | 10.0 | 9.6 | 9.5 | 9.4 | 9.3 | 9.0 | NA | | |
| RI | % Cases in RI ACOS Tx Pgms | [b] | 32 | 28 | 27 | 23 | 29 | 26 | 20 | 39 | 73 | 82 | 90 | 96 |
| RI | % Cases with AJCC Staging | [b] | 72 | 77 | 81 | 73 | 84 | 97 | 90 | 93 | 94 | 87 | 92 | 87 |
| RI | Mortality | [d] | 2.6 | 2.8 | 3.0 | 3.0 | 2.8 | 3.3 | 3.2 | 2.9 | 2.9 | NA | | |
| U.S. | Mortality | [d] | 3.6 | 3.6 | 3.5 | 3.5 | 3.4 | 3.4 | 3.3 | 3.2 | 3.1 | NA | | |

* Percentage of women who have had a Pap smear within the past three years

** Incidence and mortality rates are based on five years' data (e.g., 1989 = 1987-1991; 1998 = 1997-2000), age adjusted to the 2000 U.S. standard population, expressed as cases per 100,000.

*** Invasive includes the following stages of disease at diagnosis: local, regional, distant, and unknown

[a] Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention

[b] Rhode Island Cancer Registry, Rhode Island Department of Health

[c] National Cancer Institute. *SEER Cancer Statistics Review 1973-1999*. Bethesda, MD: National Cancer Institute, 2002.

[d] CDC Wonder, Centers for Disease Control and Prevention

NA Data not available or not applicable

## 3.3 Progress in the Control of Colorectal Cancer in Rhode Island, 1987-2000

[Leanne Chiaverini, B.S., John P. Fulton, Ph.D., Dorothy M. Darcy, A.S., CTR]

### 3.3.1 Profile

About 5000 Rhode Island residents alive today were diagnosed with colorectal cancer at some point in the past (2323 men and 2664 women in 1998), about 800 are newly diagnosed each year (408 men and 359 women in 2000), and about 300 succumb to the disease annually (125 men and 153 women in 1999). Colorectal cancer is among the top four most prevalent cancers in the state (and the nation), along with cancers of the lung, breast, and prostate. In Rhode Island, colorectal cancer accounted for 12 percent of all newly diagnosed cancers in 2000, and 11 percent of all cancer deaths in 1999.

### 3.3.2 Control Strategy

Until 1999, it was believed that high-fiber diets helped reduce the incidence of colorectal cancer, (1) but findings published at that time demonstrated absolutely no relationship between intake of dietary fiber and incidence of colorectal cancer in a carefully designed prospective study of 88,757 women in the United States ("The Nurses' Health Study"). (2) Thus, although the U.S. Department of Health and Human Services continues to promote a high-fiber diet rich in fruits and vegetables for its general effect on health, the strategy is unlikely to have a measurable effect on the burden of colorectal cancer in the United States.

A preferred strategy for the control of colorectal cancer is early detection with sigmoidoscopy or colonoscopy, followed by multidisciplinary, state-of-the-art treatment, if necessary. A number of clinical trials have demonstrated the effectiveness of screening for the reduction of colorectal cancer mortality. (3) Screening with sigmoidoscopy or colonoscopy has the added advantage that precancerous polyps may be removed during the procedure, thus preventing the development of cancer. The Rhode Island Cancer Control Plan, (4) published in September, 1998, recommends:

*Colorectal Cancer Screening*

- All persons should receive an annual digital rectal examination beginning at age 40.
- All persons 50 years of age and over should receive fecal occult blood testing annually and flexible sigmoidoscopy every 5 years. Persons positive by either screening test should be referred for colonoscopy.
- Persons at elevated risk for the development of colorectal cancer should be referred for diagnosis and management if there is:
  - a family history of hereditary syndromes associated with a high incidence of colon cancer (polyposis syndromes),
  - at least one first degree relative with colorectal cancer,
  - a personal history of colon adenomas or colon cancer,
  - inflammatory bowel disease involving the colon.

*Basic Treatment Infrastructure*

- Promote and support the adoption of American College of Surgeons (ACOS) approved cancer programs in all acute care hospitals in Rhode Island.
- Assure accurate tumor staging with American Joint Committee on Cancer (AJCC) staging methodology.

### 3.3.3 2010 Targets

*Healthy People 2010*, the most recent set of health objectives for the United States, (3) suggests the following targets for the control of colorectal cancer:

*Screening*

By 2010, increase the proportion of adults aged 50 years and older who have ever received a sigmoidoscopy to 50 percent (baseline = 37 percent in 1998). Increase the proportion of adults aged 50 years and older who have

received a fecal occult blood test (FOBT) within the preceding two years to 50 percent (baseline = 35 percent in 1998).

*Mortality*

By 2010, reduce the colorectal cancer death rate to 13.9 deaths per 100,000 population (age-adjusted to the year 2000 standard population of the United States; baseline = 21.2 deaths per 100,000 population in 1998).

### 3.3.4 Trends

(Please refer to Tables 3.3a and 3.3b.)

*Screening*

The proportion of Rhode Island men of all races aged 40 and over who had ever received a colorectal screening exam (proctoscopic, sigmoidoscopic, or colonoscopic) increased from 32 percent in 1995 to 37 percent in 1999. Among all the states, in comparison, the median proportion of men of all races aged 40 and over who had ever received a colorectal screening exam increased from 32 percent in 1995 to 34 percent in 1999. (All data for men are found in Table 3.3a.)

The proportion of Rhode Island women of all races aged 40 and over who had ever received a colorectal screening exam (proctoscopic, sigmoidoscopic, or colonoscopic) increased from 26 percent in 1995 to 37 percent in 1999. Among all the states, in comparison, the median proportion of women of all races aged 40 and over who had ever received a colorectal screening exam increased from 27 percent in 1995 to 33 percent in 1999. (All data for women are found in Table 3.3b.)

*Incidence*

The age-adjusted incidence of invasive colorectal cancer (2000 standard) among Rhode Island men of all races decreased from about 94 cases per 100,000 men in 1987-1991 to about 76 cases per 100,000 men in 1996-2000 (based on five-year moving averages). The age-adjusted incidence of invasive colorectal cancer (2000 standard) among U.S. men of all races decreased from 75 cases per 100,000 men in 1987-1991 to about 65 cases per 100,000 men in 1995-1999. U.S. rates for men were lower than Rhode Island rates for men across the period observed.

The age-adjusted incidence of invasive colorectal cancer (2000 standard) among Rhode Island women of all races decreased from about 59 cases per 100,000 women in 1987-2000 to about 56 cases per 100,000 women in 1996-2000 (based on five-year moving averages). Similarly, the age-adjusted incidence of invasive colorectal cancer (2000 standard) among U.S. women of all races decreased from about 52 cases per 100,000 women in 1987-1991 to about 48 cases per 100,000 women in 1995-1999. U.S. rates for women were lower than Rhode Island rates for women across the period observed.

In Rhode Island, the analogous rates for *in situ* colorectal cancer increased slightly over the 1987-2000 period, from 6 cases per 100,000 men in 1987-1991 to 7 cases per 100,000 men in 1996-2000, and from 3 cases per 100,000 women in 1987-1991 to 4 cases per 100,000 women in 1996-2000. When age-adjusted incidence rates of invasive cancer are broken down by stage of disease at diagnosis, one may observe a decrease in the incidence of local, regional, and distant tumors in men. There was no significant change in the incidence rates for tumors of unknown stage in men. In women, one may observe a decrease in the incidence of local and regional tumors. There was no significant change in the incidence rates of distant tumors and tumors of unknown stage in women.

*Basic Treatment Infrastructure*

From 1989 through 1999, the percentage of Rhode Island men or women newly diagnosed with colorectal cancer who were treated under the auspices of in-state ACOS-approved cancer programs varied between 52 and 64 percent. In 2000, this percentage increased to 72 percent for Rhode Island men and 79 percent for Rhode Island women.

Prior to a change in the Rules and Regulations of the Rhode Island Cancer Registry in 1992, only about 65 percent of the colorectal cancer cases newly diagnosed among Rhode Island men and women were staged using the AJCC

system, an important basis for choosing appropriate treatments. After the Rules change, about 91 percent have been staged using the AJCC system.

*Mortality*

The age-adjusted mortality of invasive colorectal cancer (2000 standard) among Rhode Island men of all races declined from 37 per 100,000 in 1987-1991 to 30 per 100,000 in 1995-1999 (based on five-year moving averages). Similarly, the age-adjusted mortality of invasive colorectal cancer (2000 standard) among U.S. men of all races declined from 30 in 1987-1991 to 26 in 1995-1999 (based on five-year moving averages). The rates in Rhode Island were higher than the rates in the U.S. as a whole throughout the period of observation.

The age-adjusted mortality of invasive colorectal cancer (2000 standard) among Rhode Island women of all races declined from 23 per 100,000 in 1987-1991 to 20 per 100,000 in 1995-1999 (based on five-year moving averages). Similarly, the age-adjusted mortality of invasive colorectal cancer (2000 standard) among U.S. women of all races declined from 21 in 1987-1991 to 19 in 1995-1999 (based on five-year moving averages). The rates in Rhode Island were slightly higher than the rates in the U.S. as a whole throughout the period of observation.

### 3.3.5 Assessment

From 1995 to 1999 Rhode Island edged ahead of the United States in the proportions of people ages 40 and over ever screened for colorectal cancer, and differences in the proportions of Rhode Island men and women ages 40 and over screened for colorectal cancer were eliminated.

Rhode Island also made progress toward the achievement of basic treatment infrastructure goals during the 1990s. The percentage of newly diagnosed colorectal cancer cases treated under the auspices of in-state ACOS-approved hospital cancer programs increased from 52 to 72 for men and from 58 to 79 for women during the period of observation. The proportion of cases staged with AJCC staging methodology increased from 65 percent in 1989 to 92 percent in 2000 for men, and from 65 percent in 1989 to 90 percent in 2000 for women.

Among Rhode Island men and women, increased use of colorectal screening exams in the 1990s was accompanied by increased incidence of *in situ* colorectal tumors, decreased incidence of local and regional colorectal tumors, decreased or unchanged incidence of distant colorectal tumors or tumors of unknown stage, and decreased colorectal cancer mortality. The increased use of colorectal screening exams observed in the 1990s may have contributed to the observed trends in colorectal cancer incidence and mortality, although multiple factors were undoubtedly at play. Advances in treatment, for example, may have contributed substantially to the decrease in colorectal cancer mortality.

The *Healthy People 2010* goal for colorectal cancer mortality is very aggressive, but not out of reach. Colorectal cancer screening tests, much like screening tests for cervical cancer, find dysplasias that can be removed before they progress into cancer, and thus are effective preventives. Public health efforts should continue to promote colorectal cancer screening, accompanied by state-of-the-art colorectal cancer therapy.

### 3.3.6 References


1. National Institutes of Health, National Cancer Institute. Cancer Rates and Risks. 4th edition, 1996.

2. Fuchs CS, Giovannucci EL, Colditz GA, *et al.* Dietary fiber and the risk of colorectal cancer and adenoma in women. *New England Journal of Medicine.* 1999 Jan 21;340(3):169-76.

3. U.S. Department of Health and Human Services. *Healthy People 2010.* 2nd ed. With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington, DC: U.S.Government Printing Office, November 2000.

4. Rhode Island Department of Health. *Cancer Control Rhode Island – Strategic Plan for 1998-2005*. Providence, RI: Rhode Island Department of Health, September, 1998.


### 3.3.7 Tables 3.3a and 3.3b

Table 3.3a. Progress in the control of colorectal cancer among males:

- % men ages 40 and over who have ever been screened for colorectal cancer (proctoscopic exam, sigmoidoscopy, or colonoscopy)
- Average annual age-adjusted colorectal cancer incidence rates by summary stage of disease at diagnosis among men of all races
- % cases in RI ACOS-approved treatment programs, of cases with AJCC staging, and of localized cases with recommended treatment
- Average annual colorectal cancer mortality rates among men of all races

| Place | Measure | Source | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RI | % Screened * | [a] | | | | | | | 32.0 | NA | 38.2 | NA | 37.4 | |
| U.S. | % Screened | | | | | | | | 32.1 | NA | 34.6 | NA | 33.9 | |
| RI | Incidence - In Situ ** | [b] | 6.2 | 6.2 | 6.0 | 6.0 | 5.9 | 6.0 | 6.5 | 7.4 | 7.0 | 7.1 | | |
| RI | Incidence - Local | [b] | 34.5 | 34.4 | 33.0 | 31.5 | 30.0 | 28.3 | 27.8 | 27.7 | 27.9 | 30.3 | | |
| RI | Incidence - Regional | [b] | 39.0 | 37.0 | 34.6 | 33.8 | 32.2 | 30.6 | 30.1 | 30.5 | 29.8 | 28.7 | | |
| RI | Incidence - Distant | [b] | 15.1 | 14.8 | 13.8 | 14.1 | 13.8 | 13.9 | 14.2 | 13.8 | 12.7 | 12.1 | | |
| RI | Incidence - Unknown Stage | [b] | 5.6 | 4.8 | 4.4 | 4.9 | 4.9 | 5.5 | 5.8 | 5.5 | 5.2 | 4.7 | | |
| RI | Incidence - All Invasive *** | [b] | 94.1 | 91.0 | 85.8 | 84.4 | 80.9 | 78.3 | 77.8 | 77.5 | 75.7 | 75.9 | | |
| U.S. | Incidence - All Invasive | [c] | 75.0 | 73.6 | 72.2 | 70.4 | 68.2 | 66.6 | 66.1 | 65.6 | 65.1 | NA | | |
| RI | % Cases in RI ACOS Tx Pgms | [b] | 52 | 52 | 53 | 53 | 59 | 59 | 57 | 58 | 56 | 64 | 56 | 72 |
| RI | % Cases with AJCC Staging | [b] | 65 | 64 | 68 | 68 | 89 | 92 | 92 | 92 | 91 | 95 | 90 | 92 |
| RI | Mortality | [d] | 37.0 | 36.9 | 34.5 | 34.1 | 32.7 | 33.1 | 31.4 | 31.9 | 30.2 | NA | | |
| U.S. | Mortality | [d] | 30.3 | 29.9 | 29.4 | 29.0 | 28.4 | 27.9 | 27.3 | 26.7 | 26.1 | NA | | |

* Percent of men ages 40 and over who have ever been screened for colorectal cancer (proctoscopic exam, sigmoidoscopy, or colonoscopy)

** Incidence and mortality rates are based on five years' data (e.g., 1989 = 1987-1991; 1998 = 1997-2000), age adjusted to the 2000 U.S. standard population, expressed as cases per 100,000.

*** Invasive includes the following stages of disease at diagnosis: local, regional, distant, and unknown

[a] Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention

[b] Rhode Island Cancer Registry, Rhode Island Department of Health

[c] National Cancer Institute. SEER Cancer Statistics Review 1973-1999. Bethesda, MD: National Cancer Institute, 2002.

[d] CDC Wonder, Centers for Disease Control and Prevention

NA Data not available or not applicable

Table 3.3b. Progress in the control of colorectal cancer among females:

- % women ages 40 and over who have ever been screened for colorectal cancer (proctoscopic exam, sigmoidoscopy, or colonoscopy)
- Average annual age-adjusted colorectal cancer incidence rates by summary stage of disease at diagnosis among women of all races
- % cases in RI ACOS-approved treatment programs, of cases with AJCC staging, and of localized cases with recommended treatment
- Average annual colorectal cancer mortality rates among women of all races

| Place | Measure | Source | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RI | % Screened * | [a] | | | | | | | 25.6 | NA | 31.6 | NA | 37.2 | |
| U.S. | % Screened | | | | | | | | 27.1 | NA | 30.4 | NA | 32.6 | |
| RI | Incidence - In Situ ** | [b] | 2.9 | 2.9 | 3.2 | 3.2 | 3.3 | 3.6 | 3.9 | 3.9 | 4.0 | 4.0 | | |
| RI | Incidence - Local | [b] | 21.5 | 22.2 | 22.2 | 22.2 | 20.1 | 18.7 | 18.9 | 18.6 | 19.7 | 20.7 | | |
| RI | Incidence - Regional | [b] | 25.0 | 23.1 | 24.0 | 23.0 | 22.3 | 22.4 | 24.3 | 23.6 | 23.8 | 22.6 | | |
| RI | Incidence - Distant | [b] | 9.1 | 9.0 | 9.0 | 8.9 | 8.8 | 9.4 | 9.3 | 9.3 | 9.6 | 9.3 | | |
| RI | Incidence - Unknown Stage | [b] | 3.2 | 3.4 | 3.7 | 3.9 | 3.7 | 3.9 | 4.1 | 3.8 | 3.5 | 3.5 | | |
| RI | Incidence - All Invasive *** | [b] | 58.9 | 57.6 | 59.0 | 57.9 | 54.8 | 54.5 | 56.5 | 55.3 | 56.6 | 56.2 | | |
| U.S. | Incidence - All Invasive | [c] | 51.7 | 51.0 | 50.3 | 49.4 | 48.5 | 47.8 | 47.6 | 47.7 | 47.6 | NA | | |
| RI | % Cases in RI ACOS Tx Pgms | [b] | 58 | 53 | 53 | 56 | 58 | 58 | 58 | 60 | 60 | 64 | 63 | 79 |
| RI | % Cases with AJCC Staging | [b] | 65 | 59 | 62 | 68 | 87 | 90 | 96 | 90 | 90 | 90 | 92 | 90 |
| RI | Mortality | [d] | 22.7 | 22.7 | 22.2 | 21.0 | 20.7 | 20.6 | 20.2 | 19.5 | 20.2 | NA | | |
| U.S. | Mortality | [d] | 20.9 | 20.5 | 20.3 | 20.0 | 19.7 | 19.4 | 19.1 | 18.8 | 18.5 | NA | | |

* Percent of women ages 40 and over who have ever been screened for colorectal cancer (proctoscopic exam, sigmoidoscopy, or colonoscopy)

** Incidence and mortality rates are based on five years' data (e.g., 1989 = 1987-1991; 1998 = 1997-2000), age adjusted to the 2000 U.S. standard population, expressed as cases per 100,000.

*** Invasive includes the following stages of disease at diagnosis: local, regional, distant, and unknown

[a] Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention

[b] Rhode Island Cancer Registry, Rhode Island Department of Health

[c] National Cancer Institute. SEER Cancer Statistics Review 1973-1999. Bethesda, MD: National Cancer Institute, 2002.

[d] CDC Wonder, Centers for Disease Control and Prevention

NA Data not available or not applicable

## 3.4 Progress in the Control of Lung Cancer in Rhode Island, 1987-2000

[Leanne Chiaverini, B.S., John P. Fulton, Ph.D., Dorothy M. Darcy, A.S., CTR]

### 3.4.1 Profile

About 1500 Rhode Island residents alive today were diagnosed with cancer of the lung-bronchus ("lung") at some point in the past (744 men and 766 women in 1998), about 850 are newly diagnosed with lung cancer each year (469 men and 382 women in 2000), and about 700 succumb to the disease annually (397 men and 301 women in 1999). Lung cancer is among the top four most prevalent cancers in the state (and the nation), along with cancers of the colon-rectum, breast, and prostate. In Rhode Island, lung cancer accounted for 14 percent of all newly diagnosed cancers in 2000, and 28 percent of all cancer deaths in 1999.

### 3.4.2 Control Strategy

In 1964, the first Surgeon General's Report on Smoking and Health recognized cigarette smoking as a cause of cancer. (1) Since that time, more than 20 Surgeon General's reports (2) and countless studies have confirmed that cigarette smoking and exposure to environmental tobacco smoke are important risk factors for lung cancer. (3) However, heavy advertisement from economically powerful companies continues to attract new consumers, and the drug's highly addictive nature makes smoking cessation difficult. Lung cancer is a preventable cause of death, and with no effective screening procedures or treatments, the reduction of tobacco use is crucial. (3) The Rhode Island Cancer Control Plan, (4) published in September, 1998, recommends:

*Tobacco Recommendations*

- Do not smoke.
- Avoid second-hand tobacco smoke.

*Basic Treatment Infrastructure*

- Promote and support the adoption of American College of Surgeons (ACOS) approved cancer programs in all acute care hospitals in Rhode Island.
- Assure accurate tumor staging with American Joint Committee on Cancer (AJCC) staging methodology.

### 3.4.3 2010 Targets

*Healthy People 2010*, the most recent set of health objectives for the United States, (4) suggests the following targets for the control of lung cancer:

*Current Smokers*

By 2010, reduce cigarette smoking by adults aged 18 years and over to 12 percent (baseline = 24 percent in 1998), and reduce tobacco use by students in grade 9 through 12 to 21 percent (baseline = 40 percent in 1998).

*Mortality*

By 2010, reduce the lung cancer death rate to 44.9 deaths per 100,000 population (age-adjusted to the year 2000 standard population of the United States; baseline = 57.6 deaths per 100,000 population in 1998).

### 3.4.4 Trends

(Please refer to Tables 3.4a and 3.4b.)

*Current Smokers*

From 1990 through 2000, the proportion of Rhode Island men who had reported being a current smoker varied between 23 and 27 percent, showing no definite trend. The median proportion of U.S. men who had reported being a current smoker remained at around 25 percent for the entire period of observation.

From 1990 through 2000, the percent of Rhode Island women who had reported being a current smoker varied between 20 and 25 percent. Among all the states, in comparison, the median proportion of U.S. women who reported being a current smoker hovered around 21 percent.

*Incidence*

The age-adjusted incidence of invasive lung cancer (2000 standard) among Rhode Island men of all races increased from 105 cases per 100,000 men in 1987-1991 to 111 cases per 100,000 men in 1992-1996, followed by a decrease to 105 cases per 100,000 men in 1996-2000 (based on five-year moving averages). In contrast, the age-adjusted incidence of invasive lung cancer (2000 standard) among U.S. men of all races decreased from about 99 cases per 100,000 men in 1987-1991 to about 86 cases per 100,000 men in 1995-1999.

The age-adjusted incidence of invasive lung cancer (2000 standard) among Rhode Island women of all races increased from 46 cases per 100,000 women in 1987-1991 to 63 cases per 100,000 women in 1996-2000 (based on five-year moving averages). Similarly, the age-adjusted incidence of invasive lung cancer (2000 standard) among U.S. women of all races increased from 47 cases per 100,000 women in 1987-1991 to 51 cases per 100,000 women in 1995-1999.

In Rhode Island, the analogous rates for *in situ* lung cancer hovered at about 0.2 cases per 100,000 men and about 0.0 cases per 100,000 women over the 1987-2000 period. When broken down by stage of disease at diagnosis, the age-adjusted incidence of regional tumors among men decreased in the early 1990s, and the age-adjusted incidence of distant lung tumors increased in the early 1990s. No significant change has occurred in the incidence of local tumors and tumors of unknown stage. Among Rhode Island women, one may observe an increase in the incidence of local, regional, and distant lung tumors. No significant change in the incidence of tumors of unknown stage was observed.

*Basic Treatment Infrastructure*

From 1989 through 1999, the percentage of Rhode Island men newly diagnosed with lung cancer who were treated under the auspices of in-state ACOS-approved cancer programs varied between 51 and 62 percent. In 2000, this percentage increased to 73 percent. For Rhode Island women, the percentage varied from 52 to 68 with the largest increase to 83 percent in 2000.

From 1989 to 2000, the percent of newly diagnosed lung cancer cases staged using the AJCC system, an important basis for choosing appropriate treatments, steadily increased from 71 to 93 percent for men, and from 65 to 91 percent for women.

*Mortality*

The age-adjusted mortality of invasive lung cancer (2000 standard) among Rhode Island men of all races was 92 per 100,000 in 1987-1991 and 90 per 100,000 in 1995-1999 (based on five-year moving averages). This may suggest an initial decline in lung cancer mortality rates among Rhode Island men. The age-adjusted mortality of invasive lung cancer (2000 standard) among U.S. men of all races declined from 90 in 1987-1991 to 81 in 1995-1999 (based on five-year moving averages). A disparity between the mortality rates for Rhode Island men and U.S. men increased over the period of observation.

The age-adjusted mortality of invasive lung cancer (2000 standard) among Rhode Island women of all races increased from 36 per 100,000 in 1987-1991 to 46 per 100,000 in 1995-1999 (based on five-year moving averages). Similarly, the age-adjusted mortality of invasive lung cancer (2000 standard) among U.S. women of all races increased from 36 in 1987-1991 to 41 in 1995-1999 (based on five-year moving averages). A disparity between the mortality rates for Rhode Island women and U.S. women developed over the period of observation.

### 3.4.5 Assessment

Progress was made toward the achievement of basic treatment infrastructure goals in Rhode Island. The percentage of newly diagnosed lung cancer cases treated under the auspices of in-state ACOS-approved hospital cancer programs increased from 53 to 73 for men and from 52 to 83 for women during the period of observation. The

proportion of cases staged with AJCC staging methodology increased from 71 percent in 1989 to 93 percent in 2000 for men, and from 65 percent in 1989 to 91 percent in 2000 for women.

Among men and women in Rhode Island, the proportion of current smokers varied little from 1990 through 2000. The incidence of all invasive lung tumors among men peaked in the mid-1990s. When broken down by stage of disease at diagnosis, there was a decrease in the incidence of regional lung tumors and an increase in the incidence of distant lung tumors. Mortality rates for men may be starting to decrease. Among Rhode Island women, there was an increase in the incidence of all invasive tumors, an increase in the incidence of local, regional, and distant lung tumors, as well as an increase in lung cancer mortality rates. Trends in the incidence and mortality of lung cancer among women over the past decade reflect smoking trends of the recent past. Due to the latency between changes in smoking trends and changes in cancer trends, it is likely that these rates will continue to increase for a number of years.

Given the established role of tobacco in causing lung cancer, and the observed trend lung cancer mortality, particularly among women, intensified efforts to reduce the use of tobacco may be necessary to reach the *Healthy People 2010* goals. Public health efforts should focus on discouraging youth from starting to smoke, increasing cessation among those who do smoke, (3) and continuing to make Rhode Island a smoke-free state, accompanied by the aggressive promotion, use, and evaluation of state-of-the-art lung cancer therapy, including the enrollment of patients in approved clinical trials.

### 3.4.6 References


1. U.S. Department of Health, Education, and Welfare. *Smoking and Health: Report of the Advisory Committee to the Surgeon General of the Public Health Service.* Public Health Service Publication No. 1103, 1964.

2. National Institutes of Health, National Cancer Institute. Cancer Rates and Risks. 4th edition, 1996.

3. U.S. Department of Health and Human Services. *Healthy People 2010.* 2nd ed. With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington, DC: U.S.Government Printing Office, November 2000.

4. Rhode Island Department of Health. *Cancer Control Rhode Island – Strategic Plan for 1998-2005*. Providence, RI: Rhode Island Department of Health, September, 1998.


### 3.4.7 Tables 3.4a and 3.4b

Table 3.4a. Progress in the control of lung cancer among males:

- % men who are current smokers
- Average annual age-adjusted lung cancer incidence rates by summary stage of disease at diagnosis among men of all races
- % cases in RI ACOS-approved treatment programs, of cases with AJCC staging, and of localized cases with recommended treatment
- Average annual lung cancer mortality rates among men of all races

| Place | Measure | Source | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RI | % Smokers * | [a] | NA | 27.3 | 24.9 | 24.2 | 25.9 | NA | 24.0 | 25.6 | 25.5 | 24.0 | 23.1 | 23.8 |
| U.S. | % Smokers | | NA | 24.9 | 25.1 | 24.2 | 24.0 | 23.9 | 24.8 | 25.5 | 25.4 | 25.3 | 24.2 | 24.4 |
| RI | Incidence - In Situ ** | [b] | 0.1 | 0.2 | 0.3 | 0.4 | 0.4 | 0.3 | 0.2 | 0.2 | 0.1 | 0.1 | | |
| RI | Incidence - Local | [b] | 18.3 | 18.5 | 19.4 | 19.4 | 18.7 | 18.5 | 18.0 | 17.9 | 18.2 | 17.7 | | |
| RI | Incidence - Regional | [b] | 26.5 | 25.8 | 25.3 | 23.9 | 23.4 | 23.8 | 23.1 | 22.9 | 23.2 | 24.0 | | |
| RI | Incidence - Distant | [b] | 45.7 | 46.3 | 45.7 | 45.6 | 47.2 | 50.4 | 50.1 | 51.0 | 50.9 | 49.6 | | |
| RI | Incidence - Unknown Stage | [b] | 14.7 | 15.5 | 16.8 | 17.6 | 17.4 | 18.1 | 18.0 | 15.7 | 14.5 | 13.4 | | |
| RI | Incidence - All Invasive *** | [b] | 105.1 | 106.2 | 107.3 | 106.4 | 106.6 | 110.7 | 109.2 | 107.6 | 106.8 | 104.6 | | |
| U.S. | Incidence - All Invasive | [c] | 98.7 | 97.9 | 96.9 | 95.4 | 93.8 | 91.8 | 89.4 | 88.0 | 86.0 | NA | | |
| RI | % Cases in RI ACOS Tx Pgms | [b] | 53 | 51 | 51 | 51 | 58 | 61 | 62 | 58 | 58 | 62 | 62 | 73 |
| RI | % Cases with AJCC Staging | [b] | 71 | 72 | 69 | 71 | 77 | 81 | 87 | 81 | 82 | 88 | 87 | 93 |
| RI | Mortality | [d] | 91.9 | 92.0 | 92.7 | 91.6 | 92.3 | 91.5 | 91.3 | 90.7 | 89.5 | NA | | |
| U.S. | Mortality | [d] | 90.2 | 89.8 | 89.4 | 88.7 | 87.4 | 85.9 | 84.6 | 83.0 | 81.2 | NA | | |

* Percent of men who are current smokers

** Incidence and mortality rates are based on five years' data (e.g., 1989 = 1987-1991; 1998 = 1997-2000), age adjusted to the 2000 U.S. standard population, expressed as cases per 100,000.

*** Invasive includes the following stages of disease at diagnosis: local, regional, distant, and unknown

[a] Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention

[b] Rhode Island Cancer Registry, Rhode Island Department of Health

[c] National Cancer Institute. *SEER Cancer Statistics Review 1973-1999*. Bethesda, MD: National Cancer Institute, 2002.

[d] CDC Wonder, Centers for Disease Control and Prevention

NA Data not available or not applicable

Table 3.4b. Progress in the control of lung cancer among females:

- % women who are current smokers
- Average annual age-adjusted lung cancer incidence rates by summary stage of disease at diagnosis among women of all races
- % cases in RI ACOS-approved treatment programs, of cases with AJCC staging, and of localized cases with recommended treatment
- Average annual lung cancer mortality rates among women of all races

| Place | Measure | Source | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RI | % Smokers * | [a] | NA | 24.0 | 25.1 | 20.4 | 21.1 | NA | 25.4 | 19.7 | 23.2 | 21.3 | 21.5 | 23.0 |
| U.S. | % Smokers | | NA | 21.3 | 21.3 | 21.0 | 21.1 | 21.6 | 20.9 | 21.9 | 21.1 | 20.9 | 20.8 | 21.2 |
| RI | Incidence - In Situ ** | [b] | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| RI | Incidence - Local | [b] | 10.0 | 10.8 | 11.2 | 11.0 | 10.6 | 10.1 | 10.3 | 10.9 | 11.9 | 12.5 | | |
| RI | Incidence - Regional | [b] | 9.7 | 11.1 | 11.1 | 12.1 | 12.5 | 13.5 | 13.3 | 14.3 | 14.3 | 14.4 | | |
| RI | Incidence - Distant | [b] | 20.2 | 21.4 | 20.9 | 21.5 | 23.2 | 25.3 | 25.6 | 27.0 | 28.1 | 28.4 | | |
| RI | Incidence - Unknown Stage | [b] | 6.3 | 6.4 | 7.0 | 7.7 | 8.1 | 8.1 | 8.7 | 8.4 | 7.6 | 7.2 | | |
| RI | Incidence - All Invasive *** | [b] | 46.3 | 49.6 | 50.2 | 52.4 | 54.4 | 57.0 | 57.9 | 60.6 | 61.9 | 62.5 | | |
| U.S. | Incidence - All Invasive | [c] | 46.8 | 48.0 | 48.5 | 49.4 | 49.9 | 50.3 | 50.8 | 51.4 | 51.4 | NA | | |
| RI | % Cases in RI ACOS Tx Pgms | [b] | 52 | 54 | 53 | 57 | 60 | 63 | 60 | 63 | 63 | 68 | 67 | 83 |
| RI | % Cases with AJCC Staging | [b] | 65 | 68 | 72 | 77 | 76 | 76 | 81 | 82 | 82 | 85 | 88 | 91 |
| RI | Mortality | [d] | 35.5 | 37.0 | 38.3 | 38.9 | 40.7 | 43.3 | 44.9 | 44.9 | 46.2 | NA | | |
| U.S. | Mortality | [d] | 35.6 | 36.8 | 37.9 | 38.7 | 39.4 | 40.0 | 40.5 | 40.9 | 41.1 | NA | | |

* Percent of women who are current smokers

** Incidence and mortality rates are based on five years' data (e.g., 1989 = 1987-1991; 1998 = 1997-2000), age adjusted to the 2000 U.S. standard population, expressed as cases per 100,000.

*** Invasive includes the following stages of disease at diagnosis: local, regional, distant, and unknown

[a] Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention

[b] Rhode Island Cancer Registry, Rhode Island Department of Health

[c] National Cancer Institute. *SEER Cancer Statistics Review 1973-1999*. Bethesda, MD: National Cancer Institute, 2002.

[d] CDC Wonder, Centers for Disease Control and Prevention

NA Data not available or not applicable

## 3.5 Progress in the Control of Prostate Cancer in Rhode Island, 1987-2000

[Leanne Chiaverini, B.S., John P. Fulton, Ph.D., Dorothy M. Darcy, A.S., CTR]

### 3.5.1 Profile

In Rhode Island, about 5000 men have been diagnosed with prostate cancer (4,984 in 1998), about 900 men are newly diagnosed with prostate cancer each year (896 in 2000), and about 100 succumb to the disease annually (133 in 1999). Prostate cancer is among the top four most prevalent cancers in the state (and the nation), along with cancers of the lung, colon-rectum, and breast. In Rhode Island, prostate cancer accounted for 14 percent of all newly diagnosed cancers in 2000, and five percent of all cancer deaths in 1999.

### 3.5.2 Control Strategy

Although prostate cancer has been linked to several risk factors, effective preventives are unknown. Speculations about the role of diet, environmental factors, and hormones as risk factors for prostate cancer are inconclusive. (1) Although the prostate-specific antigen (PSA) screening test is non-invasive, relatively inexpensive, and effective in the early detection of prostate tumors, its use is controversial. Clinical trials in progress have not yet proven that early detection and treatment are effective in reducing prostate cancer mortality, mass screening efforts are costly, and treatment is associated with high morbidity (e.g. urinary incontinence and sexual dysfunction). However, aggressive use of screening tests remains a key control strategy, along with the assurance of multidisciplinary, state-of-the-art treatment. The Rhode Island Cancer Control Plan, (2) published in September, 1998, recommends:

*Prostate Cancer Screening*

- Primary care providers should inform men ages 45 and over about the known risks and potential benefits of prostate cancer screening with the PSA and digital rectal examination (DRE).
- Primary care providers should make available annual screening with PSA and DRE to the following populations who, after considering information about the known risks and potential benefits of prostate cancer screening, request to be screened.
  - men ages 50 and over with at least a 10-year life expectancy
  - men ages 45 and over with a high risk of developing prostate cancer (i.e., men with a family history of prostate cancer and African-American men)

*Basic Treatment Infrastructure*

- Promote and support the adoption of American College of Surgeons (ACOS) approved cancer programs in all acute care hospitals in Rhode Island.
- Assure accurate tumor staging with American Joint Committee on Cancer (AJCC) staging methodology.

### 3.5.3 2010 Targets

*Healthy People 2010*, the most recent set of health objectives for the United States, (3) suggests the following target for the control of prostate cancer:

*Mortality*

By 2010, reduce the prostate cancer death rate to 28.8 deaths per 100,000 males (age-adjusted to the year 2000 standard population of the United States; baseline = 32.0 deaths per 100,000 males in 1998).

### 3.5.4 Trends

(Please refer to Table 3.5.)

*Screening*

Information on prostate cancer screening rates is unavailable at this time, but survey questions on prostate cancer screening were added to the 2001 Rhode Island Behavioral Risk Factor Surveillance System core questionnaire, and results should be available shortly.

*Incidence*

The age-adjusted incidence of invasive prostate cancer (2000 standard) among Rhode Island men of all races increased from 118 cases per 100,000 in 1987-1991 to 173 cases per 100,000 in 1993 and remained around 170 cases per 100,000 men until 2000 (based on five-year moving averages). From 1989 to 1992, the age-adjusted incidence of invasive prostate cancer (2000 standard) among U.S. men of all races increased from 160 cases per 100,000 men to 201 cases per 100,000 men. This was followed by a decrease to 169 cases per 100,000 in 1995-1999. Rhode Island's invasive prostate cancer rates were below rates for the nation as a whole until 1997.

In Rhode Island, the analogous rates for *in situ* prostate cancer decreased from 0.4 cases per 100,000 in 1987-1991 to 0.2 cases per 100,000 in 1991-1995 followed by a slight increase to 0.3 cases per 100,000 in 1996-2000.

When age-adjusted incidence rates of invasive prostate cancer are broken down by stage of disease at diagnosis, one may observe an increase in the incidence of local tumors (from 64 per 100,000 men in 1987-1991 to 103 per 100,000 men in 1996-2000). The incidence of regional tumors increased from 1987 to 1994 (10 cases per 100,000 in 1987-1991 to 15 cases per 100,000 in 1994) but was almost balanced out with a decrease later in the decade (12 cases per 100,000 in 1996-2000). From 1987 to 2000, the age-adjusted incidence of distant tumors steadily decreased from 19 to 8 cases per 100,000 men. Tumors of unknown stage doubled from 1989 to 1993, then hovered around 50 per 100,000 men until 1998.

*Basic Treatment Infrastructure*

For most of the years from 1989 through 1997, fewer than half of the prostate cancer cases newly diagnosed among Rhode Island men were treated under the auspices of six in-state ACOS-approved hospital cancer programs. Another program was approved in 1997, and two more in 2000, bringing the total to nine. With these additions, and with changes in the distribution of prostate cancer cases among hospitals, the proportion of newly diagnosed prostate cancer cases treated under ACOS-approved programs had increased to 76 percent by 2000.

Prior to a change in the Rules and Regulations of the Rhode Island Cancer Registry in 1992, only about half (51-54 percent) of the prostate cancer cases newly diagnosed among Rhode Island men were staged using the AJCC system, an important basis for choosing appropriate treatments. After the Rules change, the proportion of cases with AJCC staging increased to 66 percent (1993), and has averaged 70 percent from 1993 through 2000.

*Mortality*

No significant change has occurred in average annual age-adjusted mortality of invasive prostate cancer among Rhode Island men of all races (about 35 deaths per 100,000 from 1987 to 2000, based on five-year moving averages and using the year 2000 U.S. standard population). The analogous prostate cancer mortality rates for U.S. men of all races averaged 38 cases per 100,000 from 1989 through 1995, then decreased to a low of 34 cases per 100,000 in 1997 (based on five-year moving averages).

### 3.5.5 Assessment

Gains have been made toward the achievement of basic treatment infrastructure goals as set forth in the second (1998) edition of the state's cancer control plan. The proportion of newly diagnosed prostate cancer cases treated under the auspices of in-state ACOS-approved hospital cancer programs increased from 55 percent to 76 percent during the period of observation, and the proportion of cases staged with AJCC methodology increased from 51 percent to 73 percent.

Rhode Island invasive prostate cancer incidence rates increased substantially from 1989 to 1993, then maintained a plateau until 1998. When broken down by stage, increases in local tumors, regional tumors, and prostate tumors of unknown stage created the initial upward trend, while incidence rates for distant prostate tumors decreased. U.S.

prostate cancer incidence rates for invasive tumors paralleled, at a higher rate, those of Rhode Island in the early 1990s, then decreased in the late 1990s. Little variation was observed in prostate cancer mortality rates for both Rhode Island and the U.S. until around 1997 when low rates suggested the beginning of a decline.

Although other factors, such as an increase in operations for benign disease of the prostate (4), may have contributed to the increase in diagnosed prostate cancer observed in the 1990s, the introduction of the PSA screening test in the late 1980s is likely responsible for the observed upward trend in prostate cancer incidence. This trend was affected by the timing and proportions of men who were offered the new test and who elected to use it, and probably does not reflect a change in the underlying rate at which new prostate tumors develop. The trend in U.S. prostate cancer incidence is suggestive of a classic "screening effect" such as this. Rhode Island may have lagged behind the nation in using the PSA test, which would explain the disparity in incidence rates which occurred in the early 1990s.

Until clinical trials provide definitive answers on the efficacy of PSA testing, public health efforts may have to go beyond the continued promotion of screening, whatever its effectiveness in reducing prostate cancer mortality, to achieve the *Healthy People 2010* goal. Given that effective preventive measures for prostate cancer are unknown, efforts should focus on the promotion, use, and evaluation of state-of-the-art prostate cancer therapy, including enrollment of patients in approved clinical trials.

### 3.5.6 References


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3. U.S. Department of Health and Human Services. *Healthy People 2010*. 2nd ed. With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington, DC: U.S.Government Printing Office, November 2000.

4. National Institutes of Health, National Cancer Institute. Cancer Rates and Risks. 4th edition, 1996.


### 3.5.7 Table 3.5

Table 3.5. Progress in the control of prostate cancer:

- Average annual age-adjusted prostate cancer incidence rates by summary stage of disease at diagnosis among men of all races
- % cases in RI ACOS-approved treatment programs, of cases with AJCC staging, and of localized cases with recommended treatment
- Average annual prostate cancer mortality rates among men of all races

| Place | Measure | Source | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RI | Incidence - In Situ * | [a] | 0.4 | 0.4 | 0.3 | 0.3 | 0.2 | 0.2 | 0.1 | 0.1 | 0.2 | 0.3 | | |
| RI | Incidence - Local | [a] | 64.4 | 71.6 | 81.9 | 89.0 | 93.7 | 93.5 | 95.6 | 92.5 | 97.4 | 102.5 | | |
| RI | Incidence - Regional | [a] | 10.2 | 10.5 | 12.0 | 13.2 | 13.9 | 14.7 | 14.6 | 13.7 | 12.6 | 11.8 | | |
| RI | Incidence - Distant | [a] | 19.1 | 17.9 | 16.9 | 15.6 | 14.1 | 12.1 | 10.9 | 10.0 | 9.1 | 7.7 | | |
| RI | Incidence - Unknown Stage | [a] | 24.1 | 33.3 | 41.5 | 48.0 | 51.3 | 52.3 | 50.5 | 49.2 | 48.9 | 50.2 | | |
| RI | Incidence - All Invasive ** | [a] | 117.8 | 133.3 | 152.2 | 165.8 | 173.0 | 172.6 | 171.7 | 165.3 | 168.0 | 172.2 | | |
| U.S. | Incidence - All Invasive | [b] | 160.1 | 180.5 | 194.6 | 201.3 | 200.7 | 191.1 | 177.9 | 169.6 | 168.8 | NA | | |
| RI | % Cases in RI ACOS Tx Pgms | [a] | 55 | 48 | 44 | 44 | 46 | 44 | 42 | 43 | 46 | 58 | 60 | 76 |
| RI | % Cases with AJCC Staging | [a] | 51 | 53 | 52 | 54 | 66 | 63 | 73 | 71 | 69 | 71 | 73 | 73 |
| RI | Mortality | [c] | 35.8 | 35.3 | 35.3 | 34.8 | 35.9 | 35.1 | 35.4 | 35.6 | 33.8 | NA | | |
| U.S. | Mortality | [c] | 36.8 | 37.6 | 38.4 | 38.7 | 38.5 | 37.8 | 36.8 | 35.3 | 33.9 | NA | | |

* Incidence and mortality rates are based on five years' data (e.g., 1989 = 1987-1991; 1998 = 1997-2000), age adjusted to the 2000 U.S. standard population, expressed as cases per 100,000.

** Invasive includes the following stages of disease at diagnosis: local, regional, distant, and unknown

[a] Rhode Island Cancer Registry, Rhode Island Department of Health

[b] National Cancer Institute. *SEER Cancer Statistics Review 1973-1999*. Bethesda, MD: National Cancer Institute, 2002.

[c] CDC Wonder, Centers for Disease Control and Prevention

NA Data not available or not applicable

# 4 Cancer in RI, 1996-2000

## 4.1 Introduction

The Rhode Island Cancer Registry maintains up-to-date cancer statistics for the State, including incidence rates, prevalence estimates, and mortality rates. The statistics are computed for the State as a whole and for counties. The latest statistics are available for the years 1996-2000, prepared in May, 2002.

## 4.2 Sources of Data

*Incidence*

Age-adjusted incidence rates by sex and by race are computed from:

- case reports of newly diagnosed cancers made to the Rhode Island Cancer Registry
- counts of the Rhode Island population in the censuses of 1980, 1990, and 2000

*Prevalence*

Age-adjusted prevalence estimates by sex and by race are computed from:

- prevalence estimates prepared by the National Cancer Institute
- counts of the Rhode Island population in the census of 2000

*Mortality*

Age-adjusted mortality rates by sex and by race are computed from:

- death records from the Office of Vital Records, Rhode Island Department of Health
- counts of the Rhode Island population in the censuses of 1980, 1990, and 2000

## 4.3 Methods

Incidence and mortality rates and corresponding standard errors are calculated using SEERStat, software produced for public use by the Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute. The algorithms for rates, as described in SEERStat documentation, are as follows:

*Crude Rate*

A crude rate is the number of cases per 100,000 in a given population.

$$cruderate = \frac{count}{population} \times 100{,}000$$

*Age-adjusted Rate*

An age-adjusted rate is a weighted average of crude rates, where the crude rates are calculated for different age groups and the weights are the proportions of persons in the corresponding age groups of a standard population. Several sets of standard populations are included in SEER*Stat. These include the total U.S. populations (1940, 1950, 1960, 1970, 1980, and 1990), an estimate of the U.S. 2000 population, 1991 Canadian population, and the world population. The age-adjusted rate for an age group comprised of the ages x through y is calculated using the following formula:

$$aarate_{x-y} = \sum_{i=x}^{y}\left[\left(\frac{count_i}{pop_i}\right)\times 100{,}000\times\left(\frac{stdmil_i}{\sum_{j=x}^{y} stdmil_j}\right)\right]$$

where count is the number of cases for the ith age group, $pop_i$ is the relevant population for the same age group, and $stdmil_i$ is the standard population for the same age group.

*Standard Error for a Crude Rate*

This calculation assumes that the cancer counts have Poisson distributions.

$$SE_{crude} = \frac{\sqrt{count}}{population}\times 100{,}000$$

*Standard Error for an Age-adjusted Rate*

This calculation assumes that the cancer counts have Poisson distributions. Suppose that the age-adjusted rate is comprised of age groups x through y.

$$SE_{AArate} = \left[\sum_{i=x}^{y}\left(\frac{stdmil_i}{\sum_{j=x}^{y} stdmil_j}\right)^2\times\left(\frac{count_i}{population_i^2}\right)\right]^{1/2}\times 100{,}000$$

*Crude Rate Confidence Intervals*

The endpoints of a p x 100% confidence interval are calculated as:

$$CI_{low} = \frac{\left(\frac{1}{2}\left(ChiInv\left(\frac{p}{2}, 2\times count\right)\right)\right)}{population}\times 100{,}000$$

$$CI_{high} = \frac{\left(\frac{1}{2}\left(ChiInv\left(1-\frac{p}{2}, 2\times(count+1)\right)\right)\right)}{population}\times 100{,}000$$

where Chi Inv(p,n) is the inverse of the chi-squared distribution function evaluated at p and with n degrees of freedom, and we define Chi Inv (p,0) = 0.

Although the normal approximation may be used with the standard errors to obtain confidence intervals when the count is large, we use the above exact method that holds even with small counts (see Johnson and Kotz, 1969, or Fay and Feuer, 1997). When the count is large the 2 methods produce similar results.

*Age-adjusted Rate Confidence Intervals*

Suppose that the age-adjusted rate is comprised of age groups x through y, and let:

$$w_i = \frac{stdmil_i}{\left(pop_i \times \sum_{j=x}^{y} stdmil_j\right)}$$

$$w_m = \max\left(w_i\right)$$

$$v = \sum_{i=x}^{y}\left(w_i^2 \times count_i\right)$$

The endpoints of a p x 100% confidence interval are calculated as:

$$CI_{low} = \left(\frac{v}{2 \times rate}\right) \times \left(ChiInv\left(\frac{p}{2}, \frac{\left(2 \times rate^2\right)}{v}\right)\right) \times 100{,}000$$

$$CI_{high} = \left(\frac{v + w_m^2}{2\left(rate + w_m\right)}\right) \times \left(ChiInv\left(1 - \frac{p}{2}, \frac{2\left(rate + w_m\right)^2}{\left(v + w_m^2\right)}\right)\right) \times 100{,}000$$

This method for calculating the confidence interval was developed in Fay and Feuer (1997). The method produces similar confidence limits to the standard normal approximation when the counts are large and the population being studied is similar to the standard population. In other cases, the above method is more likely to ensure proper coverage.

*Note*

"Rate" used in the above formulas is not per 100,000 population.

*Source*

SEERStat Version 4.2, April, 2002.

## 4.4 List of Tables

**Table 4.1 Total Cancer Cases and Average Annual Age-adjusted Cancer Incidence Rates (U.S. Year 2000 Standard) Rhode Island, 1996-2000, All Races, by Sex and Anatomical Site**

| | Males (All Races) | | | Females (All Races) | | |
|---|---|---|---|---|---|---|
| *Sites* | *Count* | *Rate* | *SE* | *Count* | *Rate* | *SE* |
| All Sites | 14,847 | 627.1 | 5.2 | 15,287 | 480.8 | 4 |
| Oral Cavity and Pharynx | 385 | 16.1 | 0.8 | 190 | 6.1 | 0.5 |
| Lip | 22 | 1 | 0.2 | 14 | 0.4 | 0.1 |
| Tongue | 100 | 4.1 | 0.4 | 47 | 1.5 | 0.2 |
| Salivary Gland | 33 | 1.4 | 0.2 | 31 | 0.9 | 0.2 |
| Floor of Mouth | 37 | 1.5 | 0.3 | 12 | 0.4 | 0.1 |
| Gum and Other Mouth | 50 | 2.1 | 0.3 | 44 | 1.5 | 0.2 |
| Nasopharynx | 22 | 0.9 | 0.2 | 7 | 0.2 | 0.1 |
| Oropharynx | 27 | 1.1 | 0.2 | 14 | 0.5 | 0.1 |
| Hypopharynx | 55 | 2.3 | 0.3 | 13 | 0.4 | 0.1 |
| Digestive System | 2,994 | 128.5 | 2.4 | 3,011 | 86.1 | 1.6 |
| Esophagus | 224 | 9.4 | 0.6 | 90 | 2.7 | 0.3 |
| Stomach | 332 | 14.5 | 0.8 | 238 | 6.5 | 0.4 |
| Small Intestine | 52 | 2.2 | 0.3 | 52 | 1.6 | 0.2 |
| Colon and Rectum | 1,757 | 75.6 | 1.8 | 1,973 | 56 | 1.3 |
| Colon excluding Rectum | 1,218 | 52.7 | 1.5 | 1,489 | 41.9 | 1.1 |
| Rectum and Rectosigmoid Junction | 539 | 22.9 | 1 | 484 | 14.1 | 0.7 |
| Anus, Anal Canal and Anorectum | 32 | 1.3 | 0.2 | 44 | 1.4 | 0.2 |
| Liver | 139 | 5.9 | 0.5 | 62 | 1.9 | 0.2 |
| Gallbladder | 27 | 1.2 | 0.2 | 54 | 1.6 | 0.2 |
| Pancreas | 324 | 13.8 | 0.8 | 358 | 10.3 | 0.6 |
| Respiratory System | 2,794 | 117.6 | 2.2 | 2,099 | 65.4 | 1.5 |
| Larynx | 225 | 9.4 | 0.6 | 67 | 2.1 | 0.3 |
| Lung and Bronchus | 2,481 | 104.3 | 2.1 | 1,994 | 62.1 | 1.4 |
| Bones and Joints | 23 | 0.9 | 0.2 | 16 | 0.6 | 0.1 |
| Soft Tissue including Heart | 87 | 3.7 | 0.4 | 92 | 3.1 | 0.3 |
| Skin excluding Basal and Squamous | 621 | 25.9 | 1 | 447 | 14.8 | 0.7 |
| Melanomas of the Skin | 528 | 22.1 | 1 | 380 | 12.7 | 0.7 |
| Breast | 36 | 1.6 | 0.3 | 4,027 | 130.9 | 2.1 |
| Female Genital System | 0 | 0 | ~ | 1,719 | 56.5 | 1.4 |
| Cervix | 0 | 0 | ~ | 269 | 9.6 | 0.6 |
| Corpus | 0 | 0 | ~ | 828 | 26.8 | 0.9 |
| Uterus, NOS | 0 | 0 | ~ | 7 | 0.2 | 0.1 |
| Ovary | 0 | 0 | ~ | 446 | 14.7 | 0.7 |
| Male Genital System | 4,306 | 179.8 | 2.8 | 0 | 0 | ~ |
| Prostate | 4,117 | 172.3 | 2.7 | 0 | 0 | ~ |
| Testis | 156 | 6.1 | 0.5 | 0 | 0 | ~ |
| Penis | 22 | 0.9 | 0.2 | 0 | 0 | ~ |
| Urinary System | 1,686 | 71.7 | 1.8 | 809 | 24.4 | 0.9 |
| Urinary Bladder | 1,210 | 51.8 | 1.5 | 477 | 14.1 | 0.7 |
| Kidney and Renal Pelvis | 444 | 18.5 | 0.9 | 315 | 9.8 | 0.6 |
| Ureter | 22 | 0.9 | 0.2 | 12 | 0.3 | 0.1 |
| Eye and Orbit | 16 | 0.7 | 0.2 | 22 | 0.8 | 0.2 |
| Brain and Other Nervous System | 211 | 8.7 | 0.6 | 210 | 6.8 | 0.5 |
| Brain | 204 | 8.4 | 0.6 | 195 | 6.4 | 0.5 |
| Endocrine System | 107 | 4.3 | 0.4 | 309 | 11.1 | 0.6 |
| Thyroid | 88 | 3.6 | 0.4 | 293 | 10.6 | 0.6 |
| Lymphomas | 661 | 27.6 | 1.1 | 685 | 21.5 | 0.8 |
| Hodgkins Disease | 93 | 3.6 | 0.4 | 108 | 3.8 | 0.4 |
| Non-Hodgkins Lymphomas | 568 | 23.9 | 1 | 577 | 17.7 | 0.8 |
| Multiple Myeloma | 141 | 6.1 | 0.5 | 153 | 4.6 | 0.4 |
| Leukemias | 402 | 17.3 | 0.9 | 274 | 8.5 | 0.5 |
| Acute Lymphocytic Leukemia | 54 | 2.2 | 0.3 | 34 | 1.3 | 0.2 |
| Chronic Lymphocytic Leukemia | 123 | 5.3 | 0.5 | 74 | 2.1 | 0.3 |
| Acute Myeloid Leukemia | 106 | 4.5 | 0.4 | 83 | 2.5 | 0.3 |
| Chronic Myeloid Leukemia | 46 | 2 | 0.3 | 32 | 1 | 0.2 |
| Monocytic Leukemia | 8 | 0.3 | 0.1 | 5 | 0.1 | 0.1 |
| Other Leukemia | 60 | 2.7 | 0.4 | 34 | 1 | 0.2 |
| Miscellaneous | 375 | 16.5 | 0.9 | 395 | 11 | 0.6 |
| Breast in situ (not in "all sites") | 2 | 0.1 | 0.1 | 829 | 28.6 | 1.0 |

~ Statistic could not be calculated.

**Table 4.2 Total Cancer Cases and Average Annual Age-adjusted Cancer Incidence Rates (U.S. Year 2000 Standard) Rhode Island, 1996-2000, Whites, by Sex and Anatomical Site**

| | Males (Whites) | | | Females (Whites) | | |
|---|---|---|---|---|---|---|
| *Sites* | *Count* | *Rate* | *SE* | *Count* | *Rate* | *SE* |
| All Sites | 14,373 | 646.6 | 5.4 | 14,858 | 502.6 | 4.2 |
| Oral Cavity and Pharynx | 373 | 16.8 | 0.9 | 181 | 6.3 | 0.5 |
| Lip | 22 | 1.1 | 0.2 | 14 | 0.5 | 0.1 |
| Tongue | 98 | 4.4 | 0.4 | 46 | 1.6 | 0.2 |
| Salivary Gland | 31 | 1.4 | 0.3 | 29 | 0.9 | 0.2 |
| Floor of Mouth | 34 | 1.5 | 0.3 | 10 | 0.3 | 0.1 |
| Gum and Other Mouth | 50 | 2.3 | 0.3 | 41 | 1.5 | 0.2 |
| Nasopharynx | 20 | 0.9 | 0.2 | 7 | 0.3 | 0.1 |
| Oropharynx | 27 | 1.2 | 0.2 | 14 | 0.5 | 0.1 |
| Hypopharynx | 54 | 2.4 | 0.3 | 12 | 0.4 | 0.1 |
| Digestive System | 2,885 | 131.4 | 2.5 | 2,913 | 88 | 1.7 |
| Esophagus | 219 | 9.8 | 0.7 | 84 | 2.6 | 0.3 |
| Stomach | 315 | 14.6 | 0.8 | 227 | 6.5 | 0.4 |
| Small Intestine | 49 | 2.2 | 0.3 | 52 | 1.8 | 0.2 |
| Colon and Rectum | 1,714 | 78.1 | 1.9 | 1,915 | 57.4 | 1.3 |
| Colon excluding Rectum | 1,186 | 54.2 | 1.6 | 1,448 | 43 | 1.2 |
| Rectum and Rectosigmoid Junction | 528 | 23.8 | 1 | 467 | 14.4 | 0.7 |
| Anus, Anal Canal and Anorectum | 30 | 1.4 | 0.3 | 43 | 1.5 | 0.2 |
| Liver | 126 | 5.7 | 0.5 | 59 | 1.9 | 0.3 |
| Gallbladder | 24 | 1.1 | 0.2 | 52 | 1.6 | 0.2 |
| Pancreas | 311 | 14.1 | 0.8 | 346 | 10.5 | 0.6 |
| Respiratory System | 2,702 | 120.6 | 2.3 | 2,041 | 67.8 | 1.5 |
| Larynx | 213 | 9.5 | 0.7 | 65 | 2.2 | 0.3 |
| Lung and Bronchus | 2,402 | 107 | 2.2 | 1,939 | 64.4 | 1.5 |
| Bones and Joints | 20 | 0.9 | 0.2 | 14 | 0.6 | 0.2 |
| Soft Tissue including Heart | 84 | 3.9 | 0.4 | 88 | 3.3 | 0.4 |
| Skin excluding Basal and Squamous | 614 | 27.7 | 1.1 | 444 | 16.1 | 0.8 |
| Melanomas of the Skin | 525 | 23.7 | 1 | 377 | 13.8 | 0.7 |
| Breast | 33 | 1.6 | 0.3 | 3,922 | 137.4 | 2.2 |
| Female Genital System | 0 | 0 | ~ | 1,668 | 59.4 | 1.5 |
| Cervix | 0 | 0 | ~ | 253 | 10.1 | 0.6 |
| Corpus | 0 | 0 | ~ | 810 | 28.2 | 1 |
| Uterus, NOS | 0 | 0 | ~ | 7 | 0.2 | 0.1 |
| Ovary | 0 | 0 | ~ | 432 | 15.4 | 0.8 |
| Male Genital System | 4,154 | 184.2 | 2.9 | 0 | 0 | ~ |
| Prostate | 3,972 | 176 | 2.8 | 0 | 0 | ~ |
| Testis | 153 | 6.9 | 0.6 | 0 | 0 | ~ |
| Penis | 19 | 0.9 | 0.2 | 0 | 0 | ~ |
| Urinary System | 1,655 | 74.7 | 1.8 | 790 | 25.4 | 0.9 |
| Urinary Bladder | 1,196 | 54.2 | 1.6 | 470 | 14.8 | 0.7 |
| Kidney and Renal Pelvis | 427 | 19 | 0.9 | 303 | 10.2 | 0.6 |
| Ureter | 22 | 1 | 0.2 | 12 | 0.3 | 0.1 |
| Eye and Orbit | 15 | 0.7 | 0.2 | 21 | 0.8 | 0.2 |
| Brain and Other Nervous System | 209 | 9.5 | 0.7 | 205 | 7.4 | 0.5 |
| Brain | 202 | 9.2 | 0.6 | 190 | 6.9 | 0.5 |
| Endocrine System | 102 | 4.6 | 0.5 | 287 | 11.6 | 0.7 |
| Thyroid | 83 | 3.7 | 0.4 | 273 | 11.1 | 0.7 |
| Lymphomas | 637 | 28.8 | 1.1 | 665 | 22.6 | 0.9 |
| Hodgkins Disease | 88 | 3.9 | 0.4 | 104 | 4.2 | 0.4 |
| Non-Hodgkins Lymphomas | 549 | 24.9 | 1.1 | 561 | 18.4 | 0.8 |
| Multiple Myeloma | 137 | 6.3 | 0.5 | 148 | 4.8 | 0.4 |
| Leukemias | 391 | 18.2 | 0.9 | 268 | 9.1 | 0.6 |
| Acute Lymphocytic Leukemia | 51 | 2.5 | 0.3 | 34 | 1.6 | 0.3 |
| Chronic Lymphocytic Leukemia | 122 | 5.6 | 0.5 | 73 | 2.2 | 0.3 |
| Acute Myeloid Leukemia | 102 | 4.7 | 0.5 | 78 | 2.6 | 0.3 |
| Chronic Myeloid Leukemia | 45 | 2.1 | 0.3 | 32 | 1.1 | 0.2 |
| Monocytic Leukemia | 8 | 0.4 | 0.1 | 5 | 0.2 | 0.1 |
| Other Leukemia | 58 | 2.8 | 0.4 | 34 | 1.1 | 0.2 |
| Miscellaneous | 360 | 16.7 | 0.9 | 386 | 11.4 | 0.6 |
| Breast in situ (not in "all sites") | 2 | 0.1 | 0.1 | 817 | 30.7 | 1.1 |

~ Statistic could not be calculated.

**Table 4.3 Total Cancer Cases and Average Annual Age-adjusted Cancer Incidence Rates (U.S. Year 2000 Standard) Rhode Island, 1996-2000, Blacks, by Sex and Anatomical Site**

| | Males (Blacks) | | | Females (Blacks) | | |
|---|---|---|---|---|---|---|
| *Sites* | *Count* | *Rate* | *SE* | *Count* | *Rate* | *SE* |
| All Sites | 376 | 683.8 | 39.3 | 320 | 446 | 25.9 |
| Oral Cavity and Pharynx | 8 | 11.8 | 4.2 | 5 | 6.9 | 3.2 |
| Lip | 0 | 0 | ~ | 0 | 0 | ~ |
| Tongue | 2 | 2.9 | 2.1 | 1 | 1.2 | 1.2 |
| Salivary Gland | 0 | 0 | ~ | 1 | 2.2 | 2.2 |
| Floor of Mouth | 3 | 3.7 | 2.1 | 0 | 0 | ~ |
| Gum and Other Mouth | 0 | 0 | ~ | 2 | 2.1 | 1.5 |
| Nasopharynx | 1 | 1.6 | 1.6 | 0 | 0 | ~ |
| Oropharynx | 0 | 0 | ~ | 0 | 0 | ~ |
| Hypopharynx | 0 | 0 | ~ | 1 | 1.4 | 1.4 |
| Digestive System | 70 | 144 | 19.4 | 76 | 120.2 | 14.2 |
| Esophagus | 5 | 6.7 | 3.1 | 6 | 8 | 3.3 |
| Stomach | 9 | 18 | 6.3 | 10 | 16.9 | 5.5 |
| Small Intestine | 2 | 4 | 2.9 | 0 | 0 | ~ |
| Colon and Rectum | 30 | 70.5 | 14.6 | 44 | 70.6 | 11 |
| Colon excluding Rectum | 22 | 54 | 13.2 | 33 | 52 | 9.3 |
| Rectum and Rectosigmoid Junction | 8 | 16.6 | 6.2 | 11 | 18.5 | 5.7 |
| Anus, Anal Canal and Anorectum | 2 | 2.7 | 2.1 | 0 | 0 | ~ |
| Liver | 5 | 7.6 | 3.5 | 0 | 0 | ~ |
| Gallbladder | 2 | 9.2 | 6.7 | 1 | 1.2 | 1.2 |
| Pancreas | 11 | 18 | 5.5 | 11 | 17.3 | 5.4 |
| Respiratory System | 81 | 146.4 | 18 | 50 | 70.7 | 10.3 |
| Larynx | 10 | 17.9 | 6 | 2 | 2.8 | 2 |
| Lung and Bronchus | 71 | 128.5 | 16.9 | 47 | 66 | 9.9 |
| Bones and Joints | 3 | 5.1 | 3.7 | 1 | 0.8 | 0.8 |
| Soft Tissue including Heart | 2 | 2.9 | 2 | 2 | 1.5 | 1 |
| Skin excluding Basal and Squamous | 4 | 3.6 | 1.8 | 1 | 1.2 | 1.2 |
| Melanomas of the Skin | 0 | 0 | ~ | 1 | 1.2 | 1.2 |
| Breast | 2 | 4 | 2.8 | 82 | 109.8 | 12.5 |
| Female Genital System | 0 | 0 | ~ | 33 | 43.7 | 7.9 |
| Cervix | 0 | 0 | ~ | 9 | 10 | 3.4 |
| Corpus | 0 | 0 | ~ | 15 | 22.4 | 5.9 |
| Uterus, NOS | 0 | 0 | ~ | 0 | 0 | ~ |
| Ovary | 0 | 0 | ~ | 7 | 8.6 | 3.4 |
| Male Genital System | 137 | 263.7 | 24.4 | 0 | 0 | ~ |
| Prostate | 131 | 254.1 | 24 | 0 | 0 | ~ |
| Testis | 2 | 1.5 | 1.1 | 0 | 0 | ~ |
| Penis | 3 | 7.1 | 4.3 | 0 | 0 | ~ |
| Urinary System | 23 | 37.1 | 8.3 | 16 | 23.1 | 6 |
| Urinary Bladder | 9 | 14.8 | 5.4 | 6 | 10.5 | 4.4 |
| Kidney and Renal Pelvis | 14 | 22.4 | 6.3 | 10 | 12.6 | 4.1 |
| Ureter | 0 | 0 | ~ | 0 | 0 | ~ |
| Eye and Orbit | 0 | 0 | ~ | 0 | 0 | ~ |
| Brain and Other Nervous System | 2 | 1.5 | 1.1 | 4 | 5.7 | 3 |
| Brain | 2 | 1.5 | 1.1 | 4 | 5.7 | 3 |
| Endocrine System | 4 | 4.7 | 2.4 | 10 | 10.3 | 3.5 |
| Thyroid | 4 | 4.7 | 2.4 | 9 | 9.1 | 3.3 |
| Lymphomas | 19 | 21.7 | 5.3 | 15 | 18.2 | 4.9 |
| Hodgkins Disease | 5 | 4.5 | 2.1 | 4 | 4.2 | 2.2 |
| Non-Hodgkins Lymphomas | 14 | 17.2 | 4.9 | 11 | 14 | 4.4 |
| Multiple Myeloma | 3 | 6.5 | 3.8 | 4 | 6.3 | 3.2 |
| Leukemias | 7 | 6.3 | 2.5 | 4 | 5.7 | 3.1 |
| Acute Lymphocytic Leukemia | 2 | 1.3 | 0.9 | 0 | 0 | ~ |
| Chronic Lymphocytic Leukemia | 1 | 1.1 | 1.1 | 1 | 1.2 | 1.2 |
| Acute Myeloid Leukemia | 2 | 1.6 | 1.2 | 3 | 4.5 | 2.8 |
| Chronic Myeloid Leukemia | 1 | 1.6 | 1.6 | 0 | 0 | ~ |
| Monocytic Leukemia | 0 | 0 | ~ | 0 | 0 | ~ |
| Other Leukemia | 1 | 0.7 | 0.7 | 0 | 0 | ~ |
| Miscellaneous | 11 | 24.6 | 8.5 | 7 | 9.1 | 3.6 |
| Breast in situ (not in "all sites") | 0 | 0.0 | ~ | 10 | 13.0 | 4.2 |

~ Statistic could not be calculated.

**Table 4.4 Total Cancer Cases and Average Annual Age-adjusted Cancer Incidence Rates (U.S. Year 1970 Standard) Rhode Island, 1996-2000, All Races, by Sex and Anatomical Site**

| | Males (All Races) | | | Females (All Races) | | |
|---|---|---|---|---|---|---|
| *Sites* | *Count* | *Rate* | *SE* | *Count* | *Rate* | *SE* |
| All Sites | 14847 | 518.2 | 4.3 | 15287 | 402.9 | 3.5 |
| Oral Cavity and Pharynx | 385 | 13.8 | 0.7 | 190 | 5.3 | 0.4 |
| Lip | 22 | 0.7 | 0.2 | 14 | 0.4 | 0.1 |
| Tongue | 100 | 3.6 | 0.4 | 47 | 1.3 | 0.2 |
| Salivary Gland | 33 | 1.2 | 0.2 | 31 | 0.8 | 0.2 |
| Floor of Mouth | 37 | 1.3 | 0.2 | 12 | 0.3 | 0.1 |
| Gum and Other Mouth | 50 | 1.8 | 0.3 | 44 | 1.2 | 0.2 |
| Nasopharynx | 22 | 0.8 | 0.2 | 7 | 0.2 | 0.1 |
| Oropharynx | 27 | 1.0 | 0.2 | 14 | 0.4 | 0.1 |
| Hypopharynx | 55 | 2.0 | 0.3 | 13 | 0.4 | 0.1 |
| Digestive System | 2994 | 102.6 | 1.9 | 3011 | 67.7 | 1.3 |
| Esophagus | 224 | 8.0 | 0.5 | 90 | 2.2 | 0.2 |
| Stomach | 332 | 11.0 | 0.6 | 238 | 4.8 | 0.3 |
| Small Intestine | 52 | 1.7 | 0.2 | 52 | 1.4 | 0.2 |
| Colon and Rectum | 1757 | 60.0 | 1.5 | 1973 | 43.8 | 1.1 |
| Colon excluding Rectum | 1218 | 41.2 | 1.2 | 1489 | 32.6 | 0.9 |
| Rectum and Rectosigmoid Junction | 539 | 18.8 | 0.8 | 484 | 11.2 | 0.6 |
| Anus, Anal Canal and Anorectum | 32 | 1.1 | 0.2 | 44 | 1.2 | 0.2 |
| Liver | 139 | 5.0 | 0.4 | 62 | 1.6 | 0.2 |
| Gallbladder | 27 | 0.9 | 0.2 | 54 | 1.3 | 0.2 |
| Pancreas | 324 | 11.4 | 0.6 | 358 | 8.1 | 0.5 |
| Respiratory System | 2794 | 97.8 | 1.9 | 2099 | 56.4 | 1.3 |
| Larynx | 225 | 8.2 | 0.6 | 67 | 1.8 | 0.2 |
| Lung and Bronchus | 2481 | 86.6 | 1.8 | 1994 | 53.6 | 1.3 |
| Bones and Joints | 23 | 0.9 | 0.2 | 16 | 0.5 | 0.1 |
| Soft Tissue including Heart | 87 | 2.9 | 0.3 | 92 | 2.8 | 0.3 |
| Skin excluding Basal and Squamous | 621 | 21.5 | 0.9 | 447 | 12.2 | 0.6 |
| Melanomas of the Skin | 528 | 18.3 | 0.8 | 380 | 10.5 | 0.6 |
| Breast | 36 | 1.2 | 0.2 | 4,027 | 110.0 | 1.8 |
| Female Genital System | 0 | 0.0 | ~ | 1719 | 48.5 | 1.2 |
| Cervix | 0 | 0.0 | ~ | 269 | 8.0 | 0.5 |
| Corpus | 0 | 0.0 | ~ | 828 | 23.5 | 0.9 |
| Uterus, NOS | 0 | 0.0 | ~ | 7 | 0.2 | 0.1 |
| Ovary | 0 | 0.0 | ~ | 446 | 12.8 | 0.6 |
| Male Genital System | 4306 | 152.6 | 2.4 | 0 | 0.0 | ~ |
| Prostate | 4117 | 146.3 | 2.3 | 0 | 0.0 | ~ |
| Testis | 156 | 5.2 | 0.4 | 0 | 0.0 | ~ |
| Penis | 22 | 0.7 | 0.2 | 0 | 0.0 | ~ |
| Urinary System | 1686 | 57.9 | 1.4 | 809 | 20.2 | 0.8 |
| Urinary Bladder | 1210 | 41.3 | 1.2 | 477 | 11.5 | 0.6 |
| Kidney and Renal Pelvis | 444 | 15.5 | 0.7 | 315 | 8.4 | 0.5 |
| Ureter | 22 | 0.7 | 0.2 | 12 | 0.2 | 0.1 |
| Eye and Orbit | 16 | 0.5 | 0.1 | 22 | 0.7 | 0.2 |
| Brain and Other Nervous System | 211 | 7.6 | 0.5 | 210 | 6.1 | 0.5 |
| Brain | 204 | 7.3 | 0.5 | 195 | 5.7 | 0.5 |
| Endocrine System | 107 | 3.9 | 0.4 | 309 | 9.5 | 0.6 |
| Thyroid | 88 | 3.1 | 0.3 | 293 | 9.0 | 0.5 |
| Lymphomas | 661 | 22.9 | 0.9 | 685 | 18.3 | 0.8 |
| Hodgkins Disease | 93 | 3.3 | 0.3 | 108 | 3.7 | 0.4 |
| Non-Hodgkins Lymphomas | 568 | 19.7 | 0.8 | 577 | 14.7 | 0.7 |
| Multiple Myeloma | 141 | 4.8 | 0.4 | 153 | 3.9 | 0.3 |
| Leukemias | 402 | 14.4 | 0.7 | 274 | 7.4 | 0.5 |
| Acute Lymphocytic Leukemia | 54 | 2.4 | 0.3 | 34 | 1.5 | 0.3 |
| Chronic Lymphocytic Leukemia | 123 | 4.3 | 0.4 | 74 | 1.7 | 0.2 |
| Acute Myeloid Leukemia | 106 | 3.7 | 0.4 | 83 | 2.1 | 0.3 |
| Chronic Myeloid Leukemia | 46 | 1.6 | 0.2 | 32 | 0.8 | 0.2 |
| Monocytic Leukemia | 8 | 0.3 | 0.1 | 5 | 0.1 | 0.1 |
| Other Leukemia | 60 | 2.0 | 0.3 | 34 | 0.8 | 0.1 |
| Miscellaneous | 375 | 12.6 | 0.7 | 395 | 8.6 | 0.5 |
| Breast in situ (not in "all sites") | 2 | 0.1 | 0.0 | 829 | 24.7 | 0.9 |

~ Statistic could not be calculated.

**Table 4.5 Total Cancer Cases and Average Annual Age-adjusted Cancer Incidence Rates (U.S. Year 1970 Standard) Rhode Island, 1996-2000, Whites, by Sex and Anatomical Site**

| | Males (Whites) | | | Females (Whites) | | |
|---|---|---|---|---|---|---|
| *Sites* | *Count* | *Rate* | *SE* | *Count* | *Rate* | *SE* |
| All Sites | 14373 | 535.1 | 4.5 | 14858 | 422.2 | 3.7 |
| Oral Cavity and Pharynx | 373 | 14.4 | 0.8 | 181 | 5.4 | 0.4 |
| Lip | 22 | 0.8 | 0.2 | 14 | 0.4 | 0.1 |
| Tongue | 98 | 3.8 | 0.4 | 46 | 1.4 | 0.2 |
| Salivary Gland | 31 | 1.2 | 0.2 | 29 | 0.8 | 0.2 |
| Floor of Mouth | 34 | 1.3 | 0.2 | 10 | 0.3 | 0.1 |
| Gum and Other Mouth | 50 | 1.9 | 0.3 | 41 | 1.2 | 0.2 |
| Nasopharynx | 20 | 0.8 | 0.2 | 7 | 0.2 | 0.1 |
| Oropharynx | 27 | 1.1 | 0.2 | 14 | 0.4 | 0.1 |
| Hypopharynx | 54 | 2.1 | 0.3 | 12 | 0.4 | 0.1 |
| Digestive System | 2885 | 105.0 | 2.0 | 2913 | 69.5 | 1.4 |
| Esophagus | 219 | 8.4 | 0.6 | 84 | 2.1 | 0.3 |
| Stomach | 315 | 11.0 | 0.6 | 227 | 4.9 | 0.4 |
| Small Intestine | 49 | 1.7 | 0.3 | 52 | 1.5 | 0.2 |
| Colon and Rectum | 1714 | 62.1 | 1.5 | 1915 | 45.0 | 1.1 |
| Colon excluding Rectum | 1186 | 42.5 | 1.3 | 1448 | 33.6 | 1.0 |
| Rectum and Rectosigmoid Junction | 528 | 19.6 | 0.9 | 467 | 11.5 | 0.6 |
| Anus, Anal Canal and Anorectum | 30 | 1.1 | 0.2 | 43 | 1.2 | 0.2 |
| Liver | 126 | 4.8 | 0.4 | 59 | 1.6 | 0.2 |
| Gallbladder | 24 | 0.8 | 0.2 | 52 | 1.3 | 0.2 |
| Pancreas | 311 | 11.6 | 0.7 | 346 | 8.3 | 0.5 |
| Respiratory System | 2702 | 100.5 | 2.0 | 2041 | 58.7 | 1.4 |
| Larynx | 213 | 8.3 | 0.6 | 65 | 1.9 | 0.3 |
| Lung and Bronchus | 2402 | 88.9 | 1.8 | 1939 | 55.7 | 1.3 |
| Bones and Joints | 20 | 0.9 | 0.2 | 14 | 0.5 | 0.1 |
| Soft Tissue including Heart | 84 | 3.1 | 0.3 | 88 | 3.0 | 0.4 |
| Skin excluding Basal and Squamous | 614 | 22.9 | 0.9 | 444 | 13.3 | 0.7 |
| Melanomas of the Skin | 525 | 19.7 | 0.9 | 377 | 11.4 | 0.6 |
| Breast | 33 | 1.2 | 0.2 | 3,922 | 115.6 | 2.0 |
| Female Genital System | 0 | 0.0 | ~ | 1668 | 51.0 | 1.3 |
| Cervix | 0 | 0.0 | ~ | 253 | 8.4 | 0.5 |
| Corpus | 0 | 0.0 | ~ | 810 | 24.7 | 0.9 |
| Uterus, NOS | 0 | 0.0 | ~ | 7 | 0.2 | 0.1 |
| Ovary | 0 | 0.0 | ~ | 432 | 13.4 | 0.7 |
| Male Genital System | 4154 | 156.5 | 2.5 | 0 | 0.0 | ~ |
| Prostate | 3972 | 149.6 | 2.4 | 0 | 0.0 | ~ |
| Testis | 153 | 5.9 | 0.5 | 0 | 0.0 | ~ |
| Penis | 19 | 0.7 | 0.2 | 0 | 0.0 | ~ |
| Urinary System | 1655 | 60.3 | 1.5 | 790 | 21.2 | 0.8 |
| Urinary Bladder | 1196 | 43.3 | 1.3 | 470 | 12.1 | 0.6 |
| Kidney and Renal Pelvis | 427 | 15.9 | 0.8 | 303 | 8.7 | 0.5 |
| Ureter | 22 | 0.8 | 0.2 | 12 | 0.2 | 0.1 |
| Eye and Orbit | 15 | 0.6 | 0.1 | 21 | 0.7 | 0.2 |
| Brain and Other Nervous System | 209 | 8.3 | 0.6 | 205 | 6.7 | 0.5 |
| Brain | 202 | 8.0 | 0.6 | 190 | 6.3 | 0.5 |
| Endocrine System | 102 | 4.2 | 0.4 | 287 | 10.0 | 0.6 |
| Thyroid | 83 | 3.3 | 0.4 | 273 | 9.4 | 0.6 |
| Lymphomas | 637 | 24.0 | 1.0 | 665 | 19.4 | 0.8 |
| Hodgkins Disease | 88 | 3.5 | 0.4 | 104 | 4.1 | 0.4 |
| Non-Hodgkins Lymphomas | 549 | 20.5 | 0.9 | 561 | 15.3 | 0.7 |
| Multiple Myeloma | 137 | 5.0 | 0.4 | 148 | 4.0 | 0.4 |
| Leukemias | 391 | 15.3 | 0.8 | 268 | 8.0 | 0.6 |
| Acute Lymphocytic Leukemia | 51 | 2.7 | 0.4 | 34 | 1.9 | 0.3 |
| Chronic Lymphocytic Leukemia | 122 | 4.5 | 0.4 | 73 | 1.8 | 0.2 |
| Acute Myeloid Leukemia | 102 | 3.9 | 0.4 | 78 | 2.2 | 0.3 |
| Chronic Myeloid Leukemia | 45 | 1.6 | 0.2 | 32 | 0.9 | 0.2 |
| Monocytic Leukemia | 8 | 0.3 | 0.1 | 5 | 0.1 | 0.1 |
| Other Leukemia | 58 | 2.0 | 0.3 | 34 | 0.8 | 0.2 |
| Miscellaneous | 360 | 12.8 | 0.7 | 386 | 8.8 | 0.5 |
| Breast in situ (not in "all sites") | 2 | 0.1 | 0.1 | 817 | 26.4 | 1.0 |

~ Statistic could not be calculated.

**Table 4.6 Total Cancer Cases and Average Annual Age-adjusted Cancer Incidence Rates (U.S. Year 1970 Standard) Rhode Island, 1996-2000, Blacks, by Sex and Anatomical Site**

| | Males (Blacks) | | | Females (Blacks) | | |
|---|---|---|---|---|---|---|
| *Sites* | *Count* | *Rate* | *SE* | *Count* | *Rate* | *SE* |
| All Sites | 376 | 568.3 | 30.5 | 320 | 356.9 | 20.3 |
| Oral Cavity and Pharynx | 8 | 10.8 | 3.9 | 5 | 5.7 | 2.6 |
| Lip | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Tongue | 2 | 2.8 | 2.0 | 1 | 1.3 | 1.3 |
| Salivary Gland | 0 | 0.0 | ~ | 1 | 1.0 | 1.0 |
| Floor of Mouth | 3 | 3.2 | 1.8 | 0 | 0.0 | ~ |
| Gum and Other Mouth | 0 | 0.0 | ~ | 2 | 1.9 | 1.4 |
| Nasopharynx | 1 | 1.6 | 1.6 | 0 | 0.0 | ~ |
| Oropharynx | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Hypopharynx | 0 | 0.0 | ~ | 1 | 1.4 | 1.4 |
| Digestive System | 70 | 112.3 | 14.0 | 76 | 86.4 | 10.0 |
| Esophagus | 5 | 5.7 | 2.7 | 6 | 7.4 | 3.0 |
| Stomach | 9 | 14.5 | 5.0 | 10 | 11.0 | 3.5 |
| Small Intestine | 2 | 3.4 | 2.4 | 0 | 0.0 | ~ |
| Colon and Rectum | 30 | 51.5 | 9.7 | 44 | 49.8 | 7.6 |
| Colon excluding Rectum | 22 | 38.2 | 8.5 | 33 | 36.4 | 6.4 |
| Rectum and Rectosigmoid Junction | 8 | 13.3 | 4.8 | 11 | 13.4 | 4.0 |
| Anus, Anal Canal and Anorectum | 2 | 2.3 | 1.8 | 0 | 0.0 | ~ |
| Liver | 5 | 7.2 | 3.4 | 0 | 0.0 | ~ |
| Gallbladder | 2 | 4.9 | 3.5 | 1 | 1.2 | 1.2 |
| Pancreas | 11 | 16.4 | 5.0 | 11 | 12.2 | 3.7 |
| Respiratory System | 81 | 122.5 | 14.1 | 50 | 59.9 | 8.5 |
| Larynx | 10 | 15.5 | 5.0 | 2 | 2.4 | 1.7 |
| Lung and Bronchus | 71 | 107.0 | 13.2 | 47 | 56.2 | 8.3 |
| Bones and Joints | 3 | 3.8 | 2.5 | 1 | 0.6 | 0.6 |
| Soft Tissue including Heart | 2 | 2.8 | 2.0 | 2 | 1.6 | 1.1 |
| Skin excluding Basal and Squamous | 4 | 2.9 | 1.5 | 1 | 1.2 | 1.2 |
| Melanomas of the Skin | 0 | 0.0 | ~ | 1 | 1.2 | 1.2 |
| Breast | 2 | 3.3 | 2.4 | 82 | 92.3 | 10.4 |
| Female Genital System | 0 | 0.0 | ~ | 33 | 35.9 | 6.4 |
| Cervix | 0 | 0.0 | ~ | 9 | 8.1 | 2.8 |
| Corpus | 0 | 0.0 | ~ | 15 | 18.3 | 4.8 |
| Uterus, NOS | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Ovary | 0 | 0.0 | ~ | 7 | 7.4 | 2.9 |
| Male Genital System | 137 | 222.2 | 19.4 | 0 | 0.0 | ~ |
| Prostate | 131 | 214.6 | 19.1 | 0 | 0.0 | ~ |
| Testis | 2 | 1.4 | 1.0 | 0 | 0.0 | ~ |
| Penis | 3 | 5.5 | 3.2 | 0 | 0.0 | ~ |
| Urinary System | 23 | 33.1 | 7.2 | 16 | 16.8 | 4.3 |
| Urinary Bladder | 9 | 13.1 | 4.6 | 6 | 6.8 | 2.8 |
| Kidney and Renal Pelvis | 14 | 20.1 | 5.6 | 10 | 10.0 | 3.3 |
| Ureter | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Eye and Orbit | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Brain and Other Nervous System | 2 | 1.5 | 1.1 | 4 | 4.6 | 2.3 |
| Brain | 2 | 1.5 | 1.1 | 4 | 4.6 | 2.3 |
| Endocrine System | 4 | 4.3 | 2.3 | 10 | 8.4 | 2.8 |
| Thyroid | 4 | 4.3 | 2.3 | 9 | 7.1 | 2.4 |
| Lymphomas | 19 | 18.0 | 4.4 | 15 | 15.5 | 4.1 |
| Hodgkins Disease | 5 | 4.2 | 1.9 | 4 | 3.8 | 2.0 |
| Non-Hodgkins Lymphomas | 14 | 13.8 | 4.0 | 11 | 11.7 | 3.6 |
| Multiple Myeloma | 3 | 5.2 | 3.0 | 4 | 4.6 | 2.3 |
| Leukemias | 7 | 6.4 | 2.5 | 4 | 4.3 | 2.2 |
| Acute Lymphocytic Leukemia | 2 | 1.8 | 1.3 | 0 | 0.0 | ~ |
| Chronic Lymphocytic Leukemia | 1 | 0.9 | 0.9 | 1 | 1.3 | 1.3 |
| Acute Myeloid Leukemia | 2 | 1.5 | 1.1 | 3 | 3.0 | 1.7 |
| Chronic Myeloid Leukemia | 1 | 1.6 | 1.6 | 0 | 0.0 | ~ |
| Monocytic Leukemia | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Other Leukemia | 1 | 0.6 | 0.6 | 0 | 0.0 | ~ |
| Miscellaneous | 11 | 19.1 | 5.9 | 7 | 8.0 | 3.1 |
| Breast in situ (not in "all sites") | 0 | 0.0 | ~ | 10 | 11.2 | 3.6 |

~ Statistic could not be calculated.

**Table 4.7 Total Cancer Cases and Average Annual Age-adjusted Cancer Incidence Rates (U.S. Year 2000 Standard) Rhode Island Counties, 1996-2000, All Races, by Sex and Selected Anatomical Site**

| | Males (All Races) | | | Females (All Races) | | |
|---|---|---|---|---|---|---|
| *Counties / Sites* | *Count* | *Rate* | *SE* | *Count* | *Rate* | *SE* |
| All Counties | | | | | | |
| All Sites | 14,847 | 627.1 | 5.2 | 15,287 | 480.8 | 4.0 |
| Colon and Rectum | 1,757 | 75.6 | 1.8 | 1,973 | 56.0 | 1.3 |
| Lung and Bronchus | 2,481 | 104.3 | 2.1 | 1,994 | 62.1 | 1.4 |
| Melanomas of the Skin | 528 | 22.1 | 1.0 | 380 | 12.7 | 0.7 |
| Breast | 38 | 1.7 | 0.3 | 4,856 | 159.5 | 2.3 |
| Cervix | 0 | 0.0 | ~ | 269 | 9.6 | 0.6 |
| Prostate | 4,117 | 172.3 | 2.7 | 0 | 0.0 | ~ |
| Bristol County | | | | | | |
| All Sites | 795 | 605.1 | 21.7 | 745 | 449.3 | 16.8 |
| Colon and Rectum | 96 | 76.0 | 7.9 | 86 | 47.0 | 5.2 |
| Lung and Bronchus | 125 | 93.0 | 8.4 | 84 | 48.8 | 5.4 |
| Melanomas of the Skin | 31 | 24.1 | 4.4 | 16 | 10.2 | 2.6 |
| Breast | 2 | 1.4 | 1.0 | 264 | 169.1 | 10.6 |
| Cervix | 0 | 0.0 | ~ | 3 | 2.1 | 1.3 |
| Prostate | 220 | 165.1 | 11.2 | 0 | 0.0 | ~ |
| Kent County | | | | | | |
| All Sites | 2,574 | 648.0 | 13.0 | 2,623 | 497.1 | 9.8 |
| Colon and Rectum | 323 | 83.6 | 4.8 | 310 | 54.5 | 3.1 |
| Lung and Bronchus | 452 | 111.3 | 5.3 | 363 | 67.3 | 3.6 |
| Melanomas of the Skin | 88 | 21.5 | 2.3 | 69 | 14.0 | 1.7 |
| Breast | 4 | 0.9 | 0.5 | 866 | 168.2 | 5.8 |
| Cervix | 0 | 0.0 | ~ | 47 | 9.9 | 1.5 |
| Prostate | 658 | 163.4 | 6.4 | 0 | 0.0 | ~ |
| Newport County | | | | | | |
| All Sites | 1,297 | 639.4 | 18.0 | 1,346 | 520.9 | 14.3 |
| Colon and Rectum | 148 | 74.2 | 6.2 | 165 | 59.3 | 4.7 |
| Lung and Bronchus | 185 | 92.6 | 6.9 | 190 | 72.7 | 5.3 |
| Melanomas of the Skin | 52 | 24.9 | 3.5 | 41 | 16.1 | 2.5 |
| Breast | 4 | 1.8 | 0.9 | 466 | 184.6 | 8.6 |
| Cervix | 0 | 0.0 | ~ | 13 | 5.6 | 1.6 |
| Prostate | 454 | 220.3 | 10.4 | 0 | 0.0 | ~ |
| Providence County | | | | | | |
| All Sites | 8,432 | 616.1 | 6.7 | 8,945 | 472.7 | 5.2 |
| Colon and Rectum | 993 | 73.4 | 2.3 | 1,219 | 56.6 | 1.7 |
| Lung and Bronchus | 1,443 | 105.3 | 2.8 | 1,136 | 59.7 | 1.8 |
| Melanomas of the Skin | 278 | 20.3 | 1.2 | 201 | 11.5 | 0.8 |
| Breast | 25 | 1.9 | 0.4 | 2,704 | 151.0 | 3.0 |
| Cervix | 0 | 0.0 | ~ | 179 | 11.0 | 0.8 |
| Prostate | 2,257 | 163.9 | 3.5 | 0 | 0.0 | ~ |
| Washington County | | | | | | |
| All Sites | 1,749 | 654.6 | 15.9 | 1,628 | 484.7 | 12.1 |
| Colon and Rectum | 197 | 76.3 | 5.5 | 193 | 55.2 | 4.0 |
| Lung and Bronchus | 276 | 102.1 | 6.2 | 221 | 66.2 | 4.5 |
| Melanomas of the Skin | 79 | 28.7 | 3.3 | 53 | 15.9 | 2.2 |
| Breast | 3 | 1.1 | 0.6 | 556 | 167.7 | 7.1 |
| Cervix | 0 | 0.0 | ~ | 27 | 8.5 | 1.6 |
| Prostate | 528 | 195.8 | 8.6 | 0 | 0.0 | ~ |

~ Statistic could not be calculated.

**Table 4.8 Total Cancer Cases and Average Annual Age-adjusted Cancer Incidence Rates (U.S. Year 1970 Standard) Rhode Island Counties, 1996-2000, All Races, by Sex and Selected Anatomical Site**

| | Males (All Races) | | | Females (All Races) | | |
|---|---|---|---|---|---|---|
| *Counties / Sites* | *Count* | *Rate* | *SE* | *Count* | *Rate* | *SE* |
| All Counties | | | | | | |
| All Sites | 14,847 | 518.2 | 4.3 | 15,287 | 402.9 | 3.5 |
| Colon and Rectum | 1,757 | 60.0 | 1.5 | 1,973 | 43.8 | 1.1 |
| Lung and Bronchus | 2,481 | 86.6 | 1.8 | 1,994 | 53.6 | 1.3 |
| Melanomas of the Skin | 528 | 18.3 | 0.8 | 380 | 10.5 | 0.6 |
| Breast | 38 | 1.3 | 0.2 | 4,856 | 134.7 | 2.0 |
| Cervix | 0 | 0.0 | ~ | 269 | 8.0 | 0.5 |
| Prostate | 4,117 | 146.3 | 2.3 | 0 | 0.0 | ~ |
| Bristol | | | | | | |
| All Sites | 795 | 495.9 | 17.9 | 745 | 374.7 | 14.6 |
| Colon and Rectum | 96 | 58.1 | 6.0 | 86 | 36.1 | 4.3 |
| Lung and Bronchus | 125 | 76.3 | 7.0 | 84 | 42.0 | 4.8 |
| Melanomas of the Skin | 31 | 20.7 | 3.8 | 16 | 8.0 | 2.1 |
| Breast | 2 | 1.2 | 0.8 | 264 | 141.6 | 9.1 |
| Cervix | 0 | 0.0 | ~ | 3 | 1.7 | 1.0 |
| Prostate | 220 | 140.7 | 9.7 | 0 | 0.0 | ~ |
| Kent | | | | | | |
| All Sites | 2,574 | 533.7 | 10.7 | 2,623 | 421.2 | 8.7 |
| Colon and Rectum | 323 | 65.6 | 3.7 | 310 | 43.7 | 2.6 |
| Lung and Bronchus | 452 | 94.4 | 4.5 | 363 | 57.9 | 3.2 |
| Melanomas of the Skin | 88 | 18.1 | 2.0 | 69 | 11.6 | 1.5 |
| Breast | 4 | 0.9 | 0.4 | 866 | 143.5 | 5.1 |
| Cervix | 0 | 0.0 | ~ | 47 | 8.4 | 1.3 |
| Prostate | 658 | 137.7 | 5.4 | 0 | 0.0 | ~ |
| Newport | | | | | | |
| All Sites | 1,297 | 537.1 | 15.0 | 1,346 | 438.4 | 12.6 |
| Colon and Rectum | 148 | 59.9 | 5.0 | 165 | 46.0 | 3.8 |
| Lung and Bronchus | 185 | 76.8 | 5.7 | 190 | 62.9 | 4.8 |
| Melanomas of the Skin | 52 | 20.8 | 2.9 | 41 | 13.0 | 2.1 |
| Breast | 4 | 1.8 | 0.9 | 466 | 158.1 | 7.6 |
| Cervix | 0 | 0.0 | ~ | 13 | 4.3 | 1.2 |
| Prostate | 454 | 191.2 | 9.0 | 0 | 0.0 | ~ |
| Providence | | | | | | |
| All Sites | 8,432 | 508.6 | 5.6 | 8,945 | 394.4 | 4.5 |
| Colon and Rectum | 993 | 58.5 | 1.9 | 1,219 | 44.0 | 1.4 |
| Lung and Bronchus | 1,443 | 86.7 | 2.3 | 1,136 | 51.3 | 1.6 |
| Melanomas of the Skin | 278 | 16.6 | 1.0 | 201 | 9.6 | 0.7 |
| Breast | 25 | 1.4 | 0.3 | 2,704 | 126.8 | 2.6 |
| Cervix | 0 | 0.0 | ~ | 179 | 9.2 | 0.7 |
| Prostate | 2,257 | 138.7 | 3.0 | 0 | 0.0 | ~ |
| Washington | | | | | | |
| All Sites | 1,749 | 540.3 | 13.0 | 1,628 | 407.5 | 10.5 |
| Colon and Rectum | 197 | 60.5 | 4.3 | 193 | 43.7 | 3.3 |
| Lung and Bronchus | 276 | 86.1 | 5.2 | 221 | 57.9 | 4.0 |
| Melanomas of the Skin | 79 | 23.6 | 2.7 | 53 | 13.3 | 1.9 |
| Breast | 3 | 0.9 | 0.5 | 556 | 142.2 | 6.2 |
| Cervix | 0 | 0.0 | ~ | 27 | 7.0 | 1.4 |
| Prostate | 528 | 166.7 | 7.3 | 0 | 0.0 | ~ |

~ Statistic could not be calculated.

**Table 4.9 Estimated Number of Rhode Islanders Alive in the Year 2000 Diagnosed with Cancer in the Past 20 Years (1981-2000), by Race, Sex and Selected Anatomical Site**

| | Males | | | Females | | |
|---|---|---|---|---|---|---|
| *Sites* | *All Races* | *Whites* | *Blacks* | *All Races* | *Whites* | *Blacks* |
| All Sites | 14679 | 14042 | 349 | 17703 | 17200 | 332 |
| Colon and Rectum | 1780 | 1687 | 36 | 2023 | 1927 | 41 |
| Lung and Bronchus | 647 | 599 | 20 | 632 | 620 | 14 |
| Melanomas of the Skin | 850 | 894 | 1 | 881 | 934 | 1 |
| Breast | ~ | ~ | ~ | 7401 | 7242 | 139 |
| Cervix | ~ | ~ | ~ | 578 | 494 | 22 |
| Prostate | 6132 | 5770 | 180 | ~ | ~ | ~ |

~ Statistic could not be calculated.

**Table 4.10 Total Cancer Deaths and Average Annual Age-adjusted Cancer Mortality Rates (U.S. Year 2000 Standard) Rhode Island, 1996-2000, All Races by Sex and Anatomical Site**

| | Males (All Races) | | | Females (All Races) | | |
|---|---|---|---|---|---|---|
| *Sites* | *Count* | *Rate* | *SE* | *Count* | *Rate* | *SE* |
| All Malignant Cancers | 6,188 | 270.7 | 3.5 | 6,171 | 179.0 | 2.3 |
| Oral Cavity and Pharynx | 79 | 3.4 | 0.4 | 64 | 1.8 | 0.2 |
| Lip | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Tongue | 23 | 1.0 | 0.2 | 16 | 0.4 | 0.1 |
| Salivary Gland | 2 | 0.1 | 0.1 | 10 | 0.3 | 0.1 |
| Floor of Mouth | 1 | 0.0 | 0.0 | 2 | 0.1 | 0.0 |
| Gum and Other Mouth | 13 | 0.6 | 0.2 | 11 | 0.3 | 0.1 |
| Nasopharynx | 4 | 0.2 | 0.1 | 7 | 0.2 | 0.1 |
| Oropharynx | 10 | 0.4 | 0.1 | 3 | 0.1 | 0.1 |
| Hypopharynx | 4 | 0.2 | 0.1 | 2 | 0.1 | 0.1 |
| Digestive System | 1,615 | 70.8 | 1.8 | 1,522 | 41.7 | 1.1 |
| Esophagus | 194 | 8.3 | 0.6 | 76 | 2.1 | 0.2 |
| Stomach | 215 | 9.5 | 0.7 | 153 | 4.2 | 0.3 |
| Small Intestine | 7 | 0.3 | 0.1 | 15 | 0.4 | 0.1 |
| Colon and Rectum | 648 | 28.9 | 1.2 | 747 | 20.1 | 0.8 |
| Colon excluding Rectum | 537 | 24.1 | 1.1 | 648 | 17.4 | 0.7 |
| Rectum and Rectosigmoid Junction | 111 | 4.8 | 0.5 | 99 | 2.7 | 0.3 |
| Anus, Anal Canal and Anorectum | 5 | 0.2 | 0.1 | 4 | 0.1 | 0.1 |
| Liver | 137 | 5.8 | 0.5 | 57 | 1.6 | 0.2 |
| Gallbladder | 20 | 0.9 | 0.2 | 31 | 0.9 | 0.2 |
| Pancreas | 328 | 14.1 | 0.8 | 347 | 9.7 | 0.5 |
| Respiratory System | 2,120 | 90.4 | 2.0 | 1,534 | 46 | 1.2 |
| Larynx | 88 | 3.8 | 0.4 | 23 | 0.7 | 0.1 |
| Lung and Bronchus | 2,016 | 85.9 | 1.9 | 1,500 | 45 | 1.2 |
| Bones and Joints | 9 | 0.4 | 0.1 | 11 | 0.4 | 0.1 |
| Soft Tissue including Heart | 50 | 2.1 | 0.3 | 47 | 1.4 | 0.2 |
| Skin excluding Basal and Squamous | 115 | 5.3 | 0.5 | 107 | 3.1 | 0.3 |
| Melanomas of the Skin | 75 | 3.3 | 0.4 | 82 | 2.5 | 0.3 |
| Breast | 6 | 0.3 | 0.1 | 970 | 29.2 | 1.0 |
| Female Genital System | 0 | 0.0 | ~ | 519 | 15.8 | 0.7 |
| Cervix | 0 | 0.0 | ~ | 84 | 2.8 | 0.3 |
| Corpus | 0 | 0.0 | ~ | 66 | 2.0 | 0.3 |
| Uterus, NOS | 0 | 0.0 | ~ | 53 | 1.5 | 0.2 |
| Ovary | 0 | 0.0 | ~ | 287 | 8.7 | 0.5 |
| Male Genital System | 714 | 33.6 | 1.3 | 0 | 0.0 | ~ |
| Prostate | 702 | 33.1 | 1.3 | 0 | 0.0 | ~ |
| Testis | 9 | 0.3 | 0.1 | 0 | 0.0 | ~ |
| Penis | 1 | 0.0 | 0.0 | 0 | 0.0 | ~ |
| Urinary System | 325 | 14.5 | 0.8 | 233 | 6.4 | 0.4 |
| Urinary Bladder | 182 | 8.3 | 0.6 | 115 | 3.1 | 0.3 |
| Kidney and Renal Pelvis | 136 | 6.0 | 0.5 | 109 | 3.1 | 0.3 |
| Ureter | 4 | 0.2 | 0.1 | 4 | 0.1 | 0.0 |
| Eye and Orbit | 2 | 0.1 | 0.1 | 2 | 0.0 | 0.0 |
| Brain and Other Nervous System | 145 | 6.0 | 0.5 | 155 | 4.7 | 0.4 |
| Brain | 144 | 0.0 | 0.5 | 153 | 4.6 | 0.4 |
| Endocrine System | 19 | 0.8 | 0.2 | 22 | 0.7 | 0.1 |
| Thyroid | 16 | 0.7 | 0.2 | 14 | 0.4 | 0.1 |
| Lymphomas | 294 | 12.7 | 0.7 | 297 | 8.3 | 0.5 |
| Hodgkins Disease | 16 | 0.7 | 0.2 | 19 | 0.6 | 0.1 |
| Non-Hodgkins Lymphomas | 278 | 12.0 | 0.7 | 278 | 7.8 | 0.5 |
| Multiple Myeloma | 79 | 3.5 | 0.4 | 97 | 2.8 | 0.3 |
| Leukemias | 235 | 10.3 | 0.7 | 181 | 5.3 | 0.4 |
| Acute Lymphocytic Leukemia | 18 | 0.8 | 0.2 | 16 | 0.5 | 0.1 |
| Chronic Lymphocytic Leukemia | 54 | 2.5 | 0.3 | 28 | 0.7 | 0.1 |
| Other Lymphocytic Leukemia | 11 | 0.5 | 0.1 | 6 | 0.2 | 0.1 |
| Acute Myeloid Leukemia | 71 | 3.0 | 0.4 | 58 | 1.8 | 0.2 |
| Chronic Myeloid Leukemia | 16 | 0.7 | 0.2 | 18 | 0.6 | 0.1 |
| Monocytic Leukemia | 5 | 0.2 | 0.1 | 3 | 0.1 | 0.0 |
| Other Leukemia | 55 | 2.4 | 0.3 | 50 | 1.5 | 0.2 |
| Miscellaneous Malignant Cancer | 381 | 16.6 | 0.9 | 410 | 11.4 | 0.6 |

~ Statistic could not be calculated.

**Table 4.11 Total Cancer Deaths and Average Annual Age-adjusted Cancer Mortality Rates (U.S. Year 2000 Standard) Rhode Island, 1996-2000, Whites by Sex and Anatomical Site**

| | Males (Whites) | | | Females (Whites) | | |
|---|---|---|---|---|---|---|
| *Sites* | *Count* | *Rate* | *SE* | *Count* | *Rate* | *SE* |
| All Malignant Cancers | 6,009 | 277.9 | 3.6 | 5,998 | 184.4 | 2.5 |
| Oral Cavity and Pharynx | 77 | 3.6 | 0.4 | 62 | 1.8 | 0.2 |
| Lip | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Tongue | 22 | 1.1 | 0.2 | 16 | 0.5 | 0.1 |
| Salivary Gland | 2 | 0.1 | 0.1 | 10 | 0.3 | 0.1 |
| Floor of Mouth | 1 | 0.0 | 0.0 | 2 | 0.1 | 0.0 |
| Gum and Other Mouth | 13 | 0.6 | 0.2 | 10 | 0.3 | 0.1 |
| Nasopharynx | 4 | 0.2 | 0.1 | 7 | 0.2 | 0.1 |
| Oropharynx | 10 | 0.5 | 0.1 | 3 | 0.1 | 0.1 |
| Hypopharynx | 4 | 0.2 | 0.1 | 1 | 0.0 | 0.0 |
| Digestive System | 1,566 | 72.5 | 1.9 | 1,477 | 42.5 | 1.1 |
| Esophagus | 186 | 8.4 | 0.6 | 74 | 2.2 | 0.3 |
| Stomach | 207 | 9.7 | 0.7 | 149 | 4.3 | 0.4 |
| Small Intestine | 6 | 0.3 | 0.1 | 15 | 0.4 | 0.1 |
| Colon and Rectum | 636 | 29.9 | 1.2 | 726 | 20.5 | 0.8 |
| Colon excluding Rectum | 526 | 24.8 | 1.1 | 629 | 17.7 | 0.7 |
| Rectum and Rectosigmoid Junction | 110 | 5.0 | 0.5 | 97 | 2.8 | 0.3 |
| Anus, Anal Canal and Anorectum | 5 | 0.2 | 0.1 | 3 | 0.1 | 0.1 |
| Liver | 132 | 6.0 | 0.5 | 57 | 1.7 | 0.2 |
| Gallbladder | 19 | 0.9 | 0.2 | 31 | 1.0 | 0.2 |
| Pancreas | 317 | 14.4 | 0.8 | 335 | 9.9 | 0.6 |
| Respiratory System | 2,057 | 92.6 | 2.1 | 1,496 | 47.6 | 1.3 |
| Larynx | 87 | 3.9 | 0.4 | 22 | 0.7 | 0.1 |
| Lung and Bronchus | 1,954 | 88.0 | 2.0 | 1,463 | 46.6 | 1.2 |
| Bones and Joints | 9 | 0.5 | 0.2 | 10 | 0.4 | 0.1 |
| Soft Tissue including Heart | 49 | 2.2 | 0.3 | 45 | 1.5 | 0.2 |
| Skin excluding Basal and Squamous | 115 | 5.6 | 0.5 | 105 | 3.3 | 0.3 |
| Melanomas of the Skin | 75 | 3.5 | 0.4 | 80 | 2.6 | 0.3 |
| Breast | 6 | 0.3 | 0.1 | 944 | 30.2 | 1.0 |
| Female Genital System | 0 | 0.0 | ~ | 503 | 16.3 | 0.7 |
| Cervix | 0 | 0.0 | ~ | 81 | 3.0 | 0.3 |
| Corpus | 0 | 0.0 | ~ | 62 | 2.0 | 0.3 |
| Uterus, NOS | 0 | 0.0 | ~ | 52 | 1.6 | 0.2 |
| Ovary | 0 | 0.0 | ~ | 279 | 8.9 | 0.5 |
| Male Genital System | 688 | 33.9 | 1.3 | 0 | 0.0 | ~ |
| Prostate | 676 | 33.3 | 1.3 | 0 | 0.0 | ~ |
| Testis | 9 | 0.4 | 0.1 | 0 | 0.0 | ~ |
| Penis | 1 | 0.0 | 0.0 | 0 | 0.0 | ~ |
| Urinary System | 320 | 15.1 | 0.9 | 229 | 6.7 | 0.5 |
| Urinary Bladder | 181 | 8.6 | 0.6 | 112 | 3.2 | 0.3 |
| Kidney and Renal Pelvis | 132 | 6.1 | 0.5 | 108 | 3.3 | 0.3 |
| Ureter | 4 | 0.2 | 0.1 | 4 | 0.1 | 0.0 |
| Eye and Orbit | 2 | 0.1 | 0.1 | 2 | 0.0 | 0.0 |
| Brain and Other Nervous System | 143 | 6.5 | 0.5 | 153 | 5.0 | 0.4 |
| Brain | 142 | 6.4 | 0.5 | 151 | 4.9 | 0.4 |
| Endocrine System | 19 | 0.8 | 0.2 | 20 | 0.6 | 0.1 |
| Thyroid | 16 | 0.7 | 0.2 | 12 | 0.3 | 0.1 |
| Lymphomas | 287 | 13.2 | 0.8 | 290 | 8.6 | 0.5 |
| Hodgkins Disease | 15 | 0.7 | 0.2 | 18 | 0.6 | 0.1 |
| Non-Hodgkins Lymphomas | 272 | 12.5 | 0.8 | 272 | 8.0 | 0.5 |
| Multiple Myeloma | 77 | 3.6 | 0.4 | 88 | 2.6 | 0.3 |
| Leukemias | 227 | 10.6 | 0.7 | 175 | 5.5 | 0.4 |
| Acute Lymphocytic Leukemia | 17 | 0.8 | 0.2 | 15 | 0.6 | 0.1 |
| Chronic Lymphocytic Leukemia | 52 | 2.5 | 0.4 | 28 | 0.8 | 0.1 |
| Other Lymphocytic Leukemia | 11 | 0.5 | 0.1 | 6 | 0.2 | 0.1 |
| Acute Myeloid Leukemia | 69 | 3.2 | 0.4 | 57 | 1.9 | 0.3 |
| Chronic Myeloid Leukemia | 14 | 0.6 | 0.2 | 18 | 0.6 | 0.1 |
| Monocytic Leukemia | 5 | 0.2 | 0.1 | 3 | 0.1 | 0.0 |
| Other Leukemia | 54 | 2.5 | 0.4 | 46 | 1.5 | 0.2 |
| Miscellaneous Malignant Cancer | 367 | 17.0 | 0.9 | 399 | 11.7 | 0.6 |

~ Statistic could not be calculated.

**Table 4.12 Total Cancer Deaths and Average Annual Age-adjusted Cancer Mortality Rates (U.S. Year 2000 Standard) Rhode Island, 1996-2000, Blacks by Sex and Anatomical Site**

| | Males (Blacks) | | | Females (Blacks) | | |
|---|---|---|---|---|---|---|
| *Sites* | *Count* | *Rate* | *SE* | *Count* | *Rate* | *SE* |
| All Malignant Cancers | 165 | 356.8 | 32.0 | 160 | 236.2 | 19.3 |
| Oral Cavity and Pharynx | 2 | 3.2 | 2.3 | 1 | 1.2 | 1.2 |
| Lip | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Tongue | 1 | 1.6 | 1.6 | 0 | 0.0 | ~ |
| Salivary Gland | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Floor of Mouth | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Gum and Other Mouth | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Nasopharynx | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Oropharynx | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Hypopharynx | 0 | 0.0 | ~ | 1 | 1.2 | 1.2 |
| Digestive System | 46 | 106.8 | 18.2 | 43 | 69.1 | 10.8 |
| Esophagus | 8 | 16.7 | 7.1 | 2 | 2.7 | 1.9 |
| Stomach | 8 | 17.2 | 6.6 | 4 | 6.7 | 3.4 |
| Small Intestine | 1 | 3.5 | 3.5 | 0 | 0.0 | ~ |
| Colon and Rectum | 10 | 26.3 | 9.7 | 20 | 33.8 | 7.8 |
| Colon excluding Rectum | 9 | 23.8 | 9.4 | 19 | 31.8 | 7.5 |
| Rectum and Rectosigmoid Junction | 1 | 2.5 | 2.5 | 1 | 2.0 | 2.0 |
| Anus, Anal Canal and Anorectum | 0 | 0.0 | ~ | 1 | 1.4 | 1.4 |
| Liver | 5 | 9.9 | 4.8 | 0 | 0.0 | ~ |
| Gallbladder | 1 | 5.7 | 5.7 | 0 | 0.0 | ~ |
| Pancreas | 10 | 17.4 | 5.6 | 12 | 19.3 | 5.7 |
| Respiratory System | 57 | 117.9 | 18.3 | 35 | 51.5 | 9.0 |
| Larynx | 1 | 1.3 | 1.3 | 1 | 1.4 | 1.4 |
| Lung and Bronchus | 56 | 116.6 | 18.3 | 34 | 50.1 | 8.9 |
| Bones and Joints | 0 | 0.0 | ~ | 1 | 0.8 | 0.8 |
| Soft Tissue including Heart | 1 | 1.6 | 1.6 | 2 | 2.1 | 1.5 |
| Skin excluding Basal and Squamous | 0 | 0.0 | ~ | 2 | 2.6 | 1.8 |
| Melanomas of the Skin | 0 | 0.0 | ~ | 2 | 2.6 | 1.8 |
| Breast | 0 | 0.0 | ~ | 25 | 34.1 | 6.9 |
| Female Genital System | 0 | 0.0 | ~ | 16 | 21.3 | 5.5 |
| Cervix | 0 | 0.0 | ~ | 3 | 3.9 | 2.4 |
| Corpus | 0 | 0.0 | ~ | 4 | 5.8 | 3.0 |
| Uterus, NOS | 0 | 0.0 | ~ | 1 | 1.4 | 1.4 |
| Ovary | 0 | 0.0 | ~ | 8 | 10.2 | 3.7 |
| Male Genital System | 25 | 71.3 | 15.5 | 0 | 0.0 | ~ |
| Prostate | 25 | 71.3 | 15.5 | 0 | 0.0 | ~ |
| Testis | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Penis | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Urinary System | 3 | 6.9 | 4.0 | 1 | 2.2 | 2.2 |
| Urinary Bladder | 1 | 2.5 | 2.5 | 1 | 2.2 | 2.2 |
| Kidney and Renal Pelvis | 2 | 4.5 | 3.2 | 0 | 0.0 | ~ |
| Ureter | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Eye and Orbit | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Brain and Other Nervous System | 2 | 2.0 | 1.5 | 2 | 3.2 | 2.3 |
| Brain | 2 | 2.0 | 1.5 | 2 | 3.2 | 2.3 |
| Endocrine System | 0 | 0.0 | ~ | 2 | 2.9 | 2.1 |
| Thyroid | 0 | 0.0 | ~ | 2 | 2.9 | 2.1 |
| Lymphomas | 7 | 7.7 | 3.0 | 7 | 9.9 | 3.9 |
| Hodgkins Disease | 1 | 1.3 | 1.3 | 1 | 1.4 | 1.4 |
| Non-Hodgkins Lymphomas | 6 | 6.4 | 2.7 | 6 | 8.5 | 3.6 |
| Multiple Myeloma | 1 | 1.6 | 1.6 | 7 | 10.1 | 3.9 |
| Leukemias | 8 | 12.7 | 5.2 | 6 | 9.5 | 4.1 |
| Acute Lymphocytic Leukemia | 1 | 0.9 | 0.9 | 1 | 0.9 | 0.9 |
| Chronic Lymphocytic Leukemia | 2 | 4.1 | 3.0 | 0 | 0.0 | ~ |
| Other Lymphocytic Leukemia | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Acute Myeloid Leukemia | 2 | 1.9 | 1.3 | 1 | 1.7 | 1.7 |
| Chronic Myeloid Leukemia | 2 | 2.3 | 1.8 | 0 | 0.0 | ~ |
| Monocytic Leukemia | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Other Leukemia | 1 | 3.5 | 3.5 | 4 | 7.0 | 3.7 |
| Miscellaneous Malignant Cancer | 13 | 24.9 | 7.2 | 10 | 15.8 | 5.2 |

~ Statistic could not be calculated.

**Table 4.13 Total Cancer Deaths and Average Annual Age-adjusted Cancer Mortality Rates (U.S. Year 1970 Standard) Rhode Island, 1996-2000, All Races by Sex and Anatomical Site**

| | Males (All Races) | | | Females (All Races) | | |
|---|---|---|---|---|---|---|
| *Sites* | *Count* | *Rate* | *SE* | *Count* | *Rate* | *SE* |
| All Malignant Cancers | 6,188 | 207.8 | 2.7 | 6,171 | 142.7 | 2.0 |
| Oral Cavity and Pharynx | 79 | 2.7 | 0.3 | 64 | 1.4 | 0.2 |
| Lip | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Tongue | 23 | 0.8 | 0.2 | 16 | 0.3 | 0.1 |
| Salivary Gland | 2 | 0.1 | 0.0 | 10 | 0.2 | 0.1 |
| Floor of Mouth | 1 | 0.0 | 0.0 | 2 | 0.0 | 0.0 |
| Gum and Other Mouth | 13 | 0.4 | 0.1 | 11 | 0.2 | 0.1 |
| Nasopharynx | 4 | 0.2 | 0.1 | 7 | 0.1 | 0.1 |
| Oropharynx | 10 | 0.3 | 0.1 | 3 | 0.1 | 0.0 |
| Hypopharynx | 4 | 0.1 | 0.1 | 2 | 0.1 | 0.1 |
| Digestive System | 1,615 | 54.5 | 1.4 | 1,522 | 31.3 | 0.9 |
| Esophagus | 194 | 6.8 | 0.5 | 76 | 1.6 | 0.2 |
| Stomach | 215 | 7.1 | 0.5 | 153 | 3.1 | 0.3 |
| Small Intestine | 7 | 0.2 | 0.1 | 15 | 0.3 | 0.1 |
| Colon and Rectum | 648 | 21.6 | 0.9 | 747 | 14.7 | 0.6 |
| Colon excluding Rectum | 537 | 17.7 | 0.8 | 648 | 12.8 | 0.6 |
| Rectum and Rectosigmoid Junction | 111 | 3.9 | 0.4 | 99 | 2.0 | 0.2 |
| Anus, Anal Canal and Anorectum | 5 | 0.2 | 0.1 | 4 | 0.1 | 0.1 |
| Liver | 137 | 4.8 | 0.4 | 57 | 1.2 | 0.2 |
| Gallbladder | 20 | 0.6 | 0.1 | 31 | 0.7 | 0.1 |
| Pancreas | 328 | 11.4 | 0.6 | 347 | 7.4 | 0.4 |
| Respiratory System | 2,120 | 72.5 | 1.6 | 1,534 | 38.4 | 1.1 |
| Larynx | 88 | 3.1 | 0.3 | 23 | 0.6 | 0.1 |
| Lung and Bronchus | 2,016 | 68.9 | 1.6 | 1,500 | 37.6 | 1.0 |
| Bones and Joints | 9 | 0.3 | 0.1 | 11 | 0.4 | 0.1 |
| Soft Tissue including Heart | 50 | 1.7 | 0.2 | 47 | 1.2 | 0.2 |
| Skin excluding Basal and Squamous | 115 | 3.9 | 0.4 | 107 | 2.4 | 0.3 |
| Melanomas of the Skin | 75 | 2.6 | 0.3 | 82 | 2.0 | 0.2 |
| Breast | 6 | 0.2 | 0.1 | 970 | 23.4 | 0.8 |
| Female Genital System | 0 | 0.0 | ~ | 519 | 13.1 | 0.6 |
| Cervix | 0 | 0.0 | ~ | 84 | 2.3 | 0.3 |
| Corpus | 0 | 0.0 | ~ | 66 | 1.7 | 0.2 |
| Uterus, NOS | 0 | 0.0 | ~ | 53 | 1.2 | 0.2 |
| Ovary | 0 | 0.0 | ~ | 287 | 7.2 | 0.5 |
| Male Genital System | 714 | 22.1 | 0.8 | 0 | 0.0 | ~ |
| Prostate | 702 | 21.7 | 0.8 | 0 | 0.0 | ~ |
| Testis | 9 | 0.3 | 0.1 | 0 | 0.0 | ~ |
| Penis | 1 | 0.0 | 0.0 | 0 | 0.0 | ~ |
| Urinary System | 325 | 10.6 | 0.6 | 233 | 5.0 | 0.4 |
| Urinary Bladder | 182 | 5.8 | 0.4 | 115 | 2.3 | 0.2 |
| Kidney and Renal Pelvis | 136 | 4.6 | 0.4 | 109 | 2.5 | 0.3 |
| Ureter | 4 | 0.1 | 0.1 | 4 | 0.1 | 0.0 |
| Eye and Orbit | 2 | 0.1 | 0.1 | 2 | 0.0 | 0.0 |
| Brain and Other Nervous System | 145 | 5.1 | 0.4 | 155 | 3.9 | 0.3 |
| Brain | 144 | 5.0 | 0.4 | 153 | 3.9 | 0.3 |
| Endocrine System | 19 | 0.7 | 0.2 | 22 | 0.5 | 0.1 |
| Thyroid | 16 | 0.5 | 0.1 | 14 | 0.3 | 0.1 |
| Lymphomas | 294 | 10.0 | 0.6 | 297 | 6.4 | 0.4 |
| Hodgkins Disease | 16 | 0.5 | 0.1 | 19 | 0.4 | 0.1 |
| Non-Hodgkins Lymphomas | 278 | 9.4 | 0.6 | 278 | 6.0 | 0.4 |
| Multiple Myeloma | 79 | 2.6 | 0.3 | 97 | 2.2 | 0.2 |
| Leukemias | 235 | 7.9 | 0.5 | 181 | 4.3 | 0.4 |
| Acute Lymphocytic Leukemia | 18 | 0.6 | 0.2 | 16 | 0.5 | 0.1 |
| Chronic Lymphocytic Leukemia | 54 | 1.7 | 0.2 | 28 | 0.5 | 0.1 |
| Other Lymphocytic Leukemia | 11 | 0.4 | 0.1 | 6 | 0.2 | 0.1 |
| Acute Myeloid Leukemia | 71 | 2.5 | 0.3 | 58 | 1.4 | 0.2 |
| Chronic Myeloid Leukemia | 16 | 0.5 | 0.1 | 18 | 0.5 | 0.1 |
| Monocytic Leukemia | 5 | 0.1 | 0.1 | 3 | 0.0 | 0.0 |
| Other Leukemia | 55 | 1.9 | 0.3 | 50 | 1.2 | 0.2 |
| Miscellaneous Malignant Cancer | 381 | 12.8 | 0.7 | 410 | 8.8 | 0.5 |
| Unknown/missing/invalid COD | 0 | 0.0 | ~ | 0 | 0.0 | ~ |

~ Statistic could not be calculated.

**Table 4.14 Total Cancer Deaths and Average Annual Age-adjusted Cancer Mortality Rates (U.S. Year 1970 Standard) Rhode Island, 1996-2000, Whites by Sex and Anatomical Site**

| | Males (Whites) | | | Females (Whites) | | |
|---|---|---|---|---|---|---|
| *Sites* | *Count* | *Rate* | *SE* | *Count* | *Rate* | *SE* |
| All Malignant Cancers | 6,009 | 213.8 | 2.8 | 5,998 | 147.4 | 2.1 |
| Oral Cavity and Pharynx | 77 | 2.8 | 0.3 | 62 | 1.4 | 0.2 |
| Lip | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Tongue | 22 | 0.8 | 0.2 | 16 | 0.3 | 0.1 |
| Salivary Gland | 2 | 0.1 | 0.0 | 10 | 0.2 | 0.1 |
| Floor of Mouth | 1 | 0.0 | 0.0 | 2 | 0.0 | 0.0 |
| Gum and Other Mouth | 13 | 0.5 | 0.1 | 10 | 0.2 | 0.1 |
| Nasopharynx | 4 | 0.2 | 0.1 | 7 | 0.1 | 0.1 |
| Oropharynx | 10 | 0.4 | 0.1 | 3 | 0.1 | 0.1 |
| Hypopharynx | 4 | 0.2 | 0.1 | 1 | 0.0 | 0.0 |
| Digestive System | 1,566 | 56.0 | 1.4 | 1,477 | 32.1 | 0.9 |
| Esophagus | 186 | 6.9 | 0.5 | 74 | 1.7 | 0.2 |
| Stomach | 207 | 7.2 | 0.5 | 149 | 3.2 | 0.3 |
| Small Intestine | 6 | 0.2 | 0.1 | 15 | 0.4 | 0.1 |
| Colon and Rectum | 636 | 22.4 | 0.9 | 726 | 15.1 | 0.6 |
| Colon excluding Rectum | 526 | 18.3 | 0.8 | 629 | 13.0 | 0.6 |
| Rectum and Rectosigmoid Junction | 110 | 4.1 | 0.4 | 97 | 2.0 | 0.2 |
| Anus, Anal Canal and Anorectum | 5 | 0.2 | 0.1 | 3 | 0.1 | 0.1 |
| Liver | 132 | 4.9 | 0.4 | 57 | 1.3 | 0.2 |
| Gallbladder | 19 | 0.6 | 0.1 | 31 | 0.8 | 0.2 |
| Pancreas | 317 | 11.7 | 0.7 | 335 | 7.6 | 0.5 |
| Respiratory System | 2,057 | 74.4 | 1.7 | 1,496 | 39.9 | 1.1 |
| Larynx | 87 | 3.3 | 0.4 | 22 | 0.6 | 0.1 |
| Lung and Bronchus | 1,954 | 70.6 | 1.6 | 1,463 | 39.0 | 1.1 |
| Bones and Joints | 9 | 0.4 | 0.1 | 10 | 0.4 | 0.1 |
| Soft Tissue including Heart | 49 | 1.8 | 0.3 | 45 | 1.2 | 0.2 |
| Skin excluding Basal and Squamous | 115 | 4.1 | 0.4 | 105 | 2.5 | 0.3 |
| Melanomas of the Skin | 75 | 2.7 | 0.3 | 80 | 2.1 | 0.3 |
| Breast | 6 | 0.2 | 0.1 | 944 | 24.3 | 0.9 |
| Female Genital System | 0 | 0.0 | ~ | 503 | 13.5 | 0.7 |
| Cervix | 0 | 0.0 | ~ | 81 | 2.5 | 0.3 |
| Corpus | 0 | 0.0 | ~ | 62 | 1.7 | 0.2 |
| Uterus, NOS | 0 | 0.0 | ~ | 52 | 1.3 | 0.2 |
| Ovary | 0 | 0.0 | ~ | 279 | 7.4 | 0.5 |
| Male Genital System | 688 | 22.3 | 0.9 | 0 | 0.0 | ~ |
| Prostate | 676 | 21.9 | 0.9 | 0 | 0.0 | ~ |
| Testis | 9 | 0.4 | 0.1 | 0 | 0.0 | ~ |
| Penis | 1 | 0.0 | 0.0 | 0 | 0.0 | ~ |
| Urinary System | 320 | 11.1 | 0.6 | 229 | 5.2 | 0.4 |
| Urinary Bladder | 181 | 6.1 | 0.5 | 112 | 2.4 | 0.3 |
| Kidney and Renal Pelvis | 132 | 4.7 | 0.4 | 108 | 2.7 | 0.3 |
| Ureter | 4 | 0.1 | 0.1 | 4 | 0.1 | 0.0 |
| Eye and Orbit | 2 | 0.1 | 0.1 | 2 | 0.0 | 0.0 |
| Brain and Other Nervous System | 143 | 5.4 | 0.5 | 153 | 4.2 | 0.4 |
| Brain | 142 | 5.4 | 0.5 | 151 | 4.2 | 0.4 |
| Endocrine System | 19 | 0.7 | 0.2 | 20 | 0.5 | 0.1 |
| Thyroid | 16 | 0.6 | 0.1 | 12 | 0.3 | 0.1 |
| Lymphomas | 287 | 10.4 | 0.6 | 290 | 6.6 | 0.4 |
| Hodgkins Disease | 15 | 0.6 | 0.1 | 18 | 0.4 | 0.1 |
| Non-Hodgkins Lymphomas | 272 | 9.8 | 0.6 | 272 | 6.2 | 0.4 |
| Multiple Myeloma | 77 | 2.6 | 0.3 | 88 | 2.1 | 0.2 |
| Leukemias | 227 | 8.2 | 0.6 | 175 | 4.6 | 0.4 |
| Acute Lymphocytic Leukemia | 17 | 0.7 | 0.2 | 15 | 0.6 | 0.2 |
| Chronic Lymphocytic Leukemia | 52 | 1.7 | 0.2 | 28 | 0.6 | 0.1 |
| Other Lymphocytic Leukemia | 11 | 0.4 | 0.1 | 6 | 0.2 | 0.1 |
| Acute Myeloid Leukemia | 69 | 2.7 | 0.3 | 57 | 1.5 | 0.2 |
| Chronic Myeloid Leukemia | 14 | 0.5 | 0.1 | 18 | 0.5 | 0.1 |
| Monocytic Leukemia | 5 | 0.2 | 0.1 | 3 | 0.0 | 0.0 |
| Other Leukemia | 54 | 1.9 | 0.3 | 46 | 1.2 | 0.2 |
| Miscellaneous Malignant Cancer | 367 | 13.1 | 0.7 | 399 | 9.0 | 0.5 |
| Unknown/missing/invalid COD | 0 | 0.0 | ~ | 0 | 0.0 | ~ |

~ Statistic could not be calculated.

**Table 4.15 Total Cancer Deaths and Average Annual Age-adjusted Cancer Mortality Rates (U.S. Year 1970 Standard) Rhode Island, 1996-2000, Blacks by Sex and Anatomical Site**

| | Males (Blacks) | | | Females (Blacks) | | |
|---|---|---|---|---|---|---|
| *Sites* | *Count* | *Rate* | *SE* | *Count* | *Rate* | *SE* |
| All Malignant Cancers | 165 | 268.8 | 21.9 | 160 | 186.0 | 14.9 |
| Oral Cavity and Pharynx | 2 | 3.2 | 2.3 | 1 | 1.3 | 1.3 |
| Lip | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Tongue | 1 | 1.6 | 1.6 | 0 | 0.0 | ~ |
| Salivary Gland | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Floor of Mouth | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Gum and Other Mouth | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Nasopharynx | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Oropharynx | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Hypopharynx | 0 | 0.0 | ~ | 1 | 1.3 | 1.3 |
| Digestive System | 46 | 78.7 | 12.1 | 43 | 49.8 | 7.6 |
| Esophagus | 8 | 12.8 | 4.8 | 2 | 2.4 | 1.7 |
| Stomach | 8 | 12.8 | 4.7 | 4 | 4.6 | 2.3 |
| Small Intestine | 1 | 2.2 | 2.2 | 0 | 0.0 | ~ |
| Colon and Rectum | 10 | 18.0 | 5.9 | 20 | 23.5 | 5.3 |
| Colon excluding Rectum | 9 | 16.3 | 5.7 | 19 | 22.2 | 5.1 |
| Rectum and Rectosigmoid Junction | 1 | 1.7 | 1.7 | 1 | 1.3 | 1.3 |
| Anus, Anal Canal and Anorectum | 0 | 0.0 | ~ | 1 | 1.2 | 1.2 |
| Liver | 5 | 8.3 | 3.8 | 0 | 0.0 | ~ |
| Gallbladder | 1 | 2.7 | 2.7 | 0 | 0.0 | ~ |
| Pancreas | 10 | 15.7 | 5.0 | 12 | 13.7 | 4.0 |
| Respiratory System | 57 | 90.7 | 12.6 | 35 | 42.5 | 7.2 |
| Larynx | 1 | 1.1 | 1.1 | 1 | 1.2 | 1.2 |
| Lung and Bronchus | 56 | 89.6 | 12.6 | 34 | 41.3 | 7.1 |
| Bones and Joints | 0 | 0.0 | ~ | 1 | 0.6 | 0.6 |
| Soft Tissue including Heart | 1 | 1.6 | 1.6 | 2 | 1.9 | 1.4 |
| Skin excluding Basal and Squamous | 0 | 0.0 | ~ | 2 | 2.5 | 1.8 |
| Melanomas of the Skin | 0 | 0.0 | ~ | 2 | 2.5 | 1.8 |
| Breast | 0 | 0.0 | ~ | 25 | 29.1 | 5.9 |
| Female Genital System | 0 | 0.0 | ~ | 16 | 18.9 | 4.8 |
| Cervix | 0 | 0.0 | ~ | 3 | 3.3 | 2.0 |
| Corpus | 0 | 0.0 | ~ | 4 | 4.9 | 2.4 |
| Uterus, NOS | 0 | 0.0 | ~ | 1 | 1.4 | 1.4 |
| Ovary | 0 | 0.0 | ~ | 8 | 9.3 | 3.3 |
| Male Genital System | 25 | 48.0 | 9.8 | 0 | 0.0 | ~ |
| Prostate | 25 | 48.0 | 9.8 | 0 | 0.0 | ~ |
| Testis | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Penis | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Urinary System | 3 | 5.1 | 3.0 | 1 | 1.0 | 1.0 |
| Urinary Bladder | 1 | 1.7 | 1.7 | 1 | 1.0 | 1.0 |
| Kidney and Renal Pelvis | 2 | 3.4 | 2.4 | 0 | 0.0 | ~ |
| Ureter | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Eye and Orbit | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Brain and Other Nervous System | 2 | 1.7 | 1.3 | 2 | 2.6 | 1.8 |
| Brain | 2 | 1.7 | 1.3 | 2 | 2.6 | 1.8 |
| Endocrine System | 0 | 0.0 | ~ | 2 | 2.5 | 1.8 |
| Thyroid | 0 | 0.0 | ~ | 2 | 2.5 | 1.8 |
| Lymphomas | 7 | 6.9 | 2.8 | 7 | 8.0 | 3.1 |
| Hodgkins Disease | 1 | 1.1 | 1.1 | 1 | 1.4 | 1.4 |
| Non-Hodgkins Lymphomas | 6 | 5.7 | 2.5 | 6 | 6.6 | 2.7 |
| Multiple Myeloma | 1 | 1.6 | 1.6 | 7 | 8.0 | 3.0 |
| Leukemias | 8 | 9.7 | 3.8 | 6 | 6.0 | 2.5 |
| Acute Lymphocytic Leukemia | 1 | 0.6 | 0.6 | 1 | 0.6 | 0.6 |
| Chronic Lymphocytic Leukemia | 2 | 3.4 | 2.4 | 0 | 0.0 | ~ |
| Other Lymphocytic Leukemia | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Acute Myeloid Leukemia | 2 | 1.3 | 0.9 | 1 | 1.2 | 1.2 |
| Chronic Myeloid Leukemia | 2 | 2.2 | 1.7 | 0 | 0.0 | ~ |
| Monocytic Leukemia | 0 | 0.0 | ~ | 0 | 0.0 | ~ |
| Other Leukemia | 1 | 2.2 | 2.2 | 4 | 4.2 | 2.2 |
| Miscellaneous Malignant Cancer | 13 | 21.5 | 6.0 | 10 | 11.4 | 3.6 |
| Unknown/missing/invalid COD | 0 | 0.0 | ~ | 0 | 0.0 | ~ |

~ Statistic could not be calculated.

**Table 4.16 Total Cancer Deaths and Average Annual Age-adjusted Cancer Mortality Rates (U.S. Year 2000 Standard) Rhode Island Counties, 1996-2000, All Races by Sex and Selected Anatomical Site**

| | Males (All Races) | | | Females (All Races) | | |
|---|---|---|---|---|---|---|
| *Counties / Sites* | *Count* | *Rate* | *SE* | *Count* | *Rate* | *SE* |
| All Counties | | | | | | |
| All Malignant Cancers | 6,188 | 270.7 | 3.5 | 6,171 | 179.0 | 2.3 |
| Colon and Rectum | 648 | 28.9 | 1.2 | 747 | 20.1 | 0.8 |
| Lung and Bronchus | 2,016 | 85.9 | 1.9 | 1,500 | 45.0 | 1.2 |
| Melanomas of the Skin | 75 | 3.3 | 0.4 | 82 | 2.5 | 0.3 |
| Breast | 6 | 0.3 | 0.1 | 970 | 29.2 | 1.0 |
| Cervix | 0 | 0.0 | ~ | 84 | 2.8 | 0.3 |
| Prostate | 702 | 33.1 | 1.3 | 0 | 0.0 | ~ |
| Bristol County | | | | | | |
| All Malignant Cancers | 347 | 268.9 | 14.7 | 283 | 155.4 | 9.4 |
| Colon and Rectum | 31 | 24.1 | 4.4 | 38 | 19.2 | 3.2 |
| Lung and Bronchus | 116 | 87.1 | 8.2 | 63 | 35.8 | 4.6 |
| Melanomas of the Skin | 3 | 2.4 | 1.4 | 6 | 3.3 | 1.4 |
| Breast | 0 | 0.0 | ~ | 45 | 26.2 | 4.0 |
| Cervix | 0 | 0.0 | ~ | 5 | 3.6 | 1.6 |
| Prostate | 41 | 34.9 | 5.6 | 0 | 0.0 | ~ |
| Kent County | | | | | | |
| All Malignant Cancers | 1,083 | 285.8 | 8.9 | 1,126 | 200.9 | 6.1 |
| Colon and Rectum | 128 | 34.3 | 3.1 | 134 | 23.0 | 2.0 |
| Lung and Bronchus | 363 | 91.6 | 4.9 | 287 | 51.7 | 3.1 |
| Melanomas of the Skin | 21 | 5.5 | 1.2 | 15 | 2.9 | 0.8 |
| Breast | 1 | 0.2 | 0.2 | 184 | 33.6 | 2.5 |
| Cervix | 0 | 0.0 | ~ | 16 | 3.1 | 0.8 |
| Prostate | 121 | 35.8 | 3.4 | 0 | 0.0 | ~ |
| Newport County | | | | | | |
| All Malignant Cancers | 479 | 252.1 | 11.7 | 490 | 177.9 | 8.1 |
| Colon and Rectum | 45 | 23.3 | 3.5 | 57 | 19.5 | 2.6 |
| Lung and Bronchus | 140 | 72.1 | 6.2 | 118 | 44.1 | 4.1 |
| Melanomas of the Skin | 4 | 1.9 | 1.0 | 7 | 2.4 | 0.9 |
| Breast | 0 | 0.0 | ~ | 78 | 29.0 | 3.3 |
| Cervix | 0 | 0.0 | ~ | 9 | 3.7 | 1.2 |
| Prostate | 64 | 37.3 | 4.8 | 0 | 0.0 | ~ |
| Providence County | | | | | | |
| All Malignant Cancers | 3,634 | 271.9 | 4.5 | 3,681 | 176.8 | 3.0 |
| Colon and Rectum | 386 | 29.4 | 1.5 | 448 | 19.4 | 0.9 |
| Lung and Bronchus | 1,181 | 86.8 | 2.5 | 867 | 43.6 | 1.5 |
| Melanomas of the Skin | 42 | 3.2 | 0.5 | 43 | 2.2 | 0.4 |
| Breast | 5 | 0.4 | 0.2 | 583 | 29.4 | 1.3 |
| Cervix | 0 | 0.0 | ~ | 46 | 2.7 | 0.4 |
| Prostate | 403 | 31.8 | 1.6 | 0 | 0.0 | ~ |
| Washington County | | | | | | |
| All Malignant Cancers | 645 | 258.1 | 10.4 | 591 | 170.1 | 7.0 |
| Colon and Rectum | 58 | 24.3 | 3.3 | 70 | 19.6 | 2.3 |
| Lung and Bronchus | 216 | 81.5 | 5.6 | 165 | 48.5 | 3.8 |
| Melanomas of the Skin | 5 | 2.5 | 1.2 | 11 | 3.3 | 1.0 |
| Breast | 0 | 0.0 | ~ | 80 | 23.2 | 2.6 |
| Cervix | 0 | 0.0 | ~ | 8 | 2.4 | 0.9 |
| Prostate | 73 | 32.7 | 3.9 | 0 | 0.0 | ~ |

~ Statistic could not be calculated.

**Table 4.17 Total Cancer Deaths and Average Annual Age-adjusted Cancer Mortality Rates (U.S. Year 1970 Standard) Rhode Island Counties, 1996-2000, All Races by Sex and Selected Anatomical Site**

| | Males (All Races) | | | Females (All Races) | | |
|---|---|---|---|---|---|---|
| *Counties / Sites* | *Count* | *Rate* | *SE* | *Count* | *Rate* | *SE* |
| All Counties | | | | | | |
| All Malignant Cancers | 6,188 | 207.8 | 2.7 | 6,171 | 142.7 | 2.0 |
| Colon and Rectum | 648 | 21.6 | 0.9 | 747 | 14.7 | 0.6 |
| Lung and Bronchus | 2,016 | 68.9 | 1.6 | 1,500 | 37.6 | 1.0 |
| Melanomas of the Skin | 75 | 2.6 | 0.3 | 82 | 2.0 | 0.2 |
| Breast | 6 | 0.2 | 0.1 | 970 | 23.4 | 0.8 |
| Cervix | 0 | 0.0 | ~ | 84 | 2.3 | 0.3 |
| Prostate | 702 | 21.7 | 0.8 | 0 | 0.0 | ~ |
| Bristol County | | | | | | |
| All Malignant Cancers | 347 | 203.4 | 11.1 | 283 | 122.9 | 8.0 |
| Colon and Rectum | 31 | 16.9 | 3.1 | 38 | 13.8 | 2.5 |
| Lung and Bronchus | 116 | 69.0 | 6.5 | 63 | 30.1 | 4.1 |
| Melanomas of the Skin | 3 | 2.2 | 1.3 | 6 | 2.8 | 1.3 |
| Breast | 0 | 0.0 | ~ | 45 | 21.6 | 3.4 |
| Cervix | 0 | 0.0 | ~ | 5 | 2.9 | 1.4 |
| Prostate | 41 | 21.5 | 3.4 | 0 | 0.0 | ~ |
| Kent County | | | | | | |
| All Malignant Cancers | 1,083 | 220.5 | 6.8 | 1,126 | 161.8 | 5.2 |
| Colon and Rectum | 128 | 26.3 | 2.3 | 134 | 17.6 | 1.6 |
| Lung and Bronchus | 363 | 74.3 | 3.9 | 287 | 43.2 | 2.7 |
| Melanomas of the Skin | 21 | 4.4 | 1.0 | 15 | 2.2 | 0.6 |
| Breast | 1 | 0.2 | 0.2 | 184 | 26.9 | 2.1 |
| Cervix | 0 | 0.0 | ~ | 16 | 2.6 | 0.7 |
| Prostate | 121 | 23.7 | 2.2 | 0 | 0.0 | ~ |
| Newport County | | | | | | |
| All Malignant Cancers | 479 | 191.8 | 8.8 | 490 | 141.9 | 6.9 |
| Colon and Rectum | 45 | 18.0 | 2.7 | 57 | 14.3 | 2.1 |
| Lung and Bronchus | 140 | 57.1 | 4.9 | 118 | 37.1 | 3.6 |
| Melanomas of the Skin | 4 | 1.6 | 0.8 | 7 | 1.6 | 0.7 |
| Breast | 0 | 0.0 | ~ | 78 | 23.9 | 2.9 |
| Cervix | 0 | 0.0 | ~ | 9 | 2.9 | 1.0 |
| Prostate | 64 | 24.6 | 3.1 | 0 | 0.0 | ~ |
| Providence County | | | | | | |
| All Malignant Cancers | 3,634 | 209.3 | 3.5 | 3,681 | 140.4 | 2.6 |
| Colon and Rectum | 386 | 21.9 | 1.1 | 448 | 13.9 | 0.7 |
| Lung and Bronchus | 1,181 | 69.2 | 2.1 | 867 | 36.3 | 1.3 |
| Melanomas of the Skin | 42 | 2.5 | 0.4 | 43 | 1.8 | 0.3 |
| Breast | 5 | 0.3 | 0.1 | 583 | 23.5 | 1.1 |
| Cervix | 0 | 0.0 | ~ | 46 | 2.3 | 0.4 |
| Prostate | 403 | 20.9 | 1.1 | 0 | 0.0 | ~ |
| Washington County | | | | | | |
| All Malignant Cancers | 645 | 196.0 | 7.8 | 591 | 137.1 | 5.9 |
| Colon and Rectum | 58 | 17.4 | 2.3 | 70 | 14.7 | 1.9 |
| Lung and Bronchus | 216 | 67.3 | 4.6 | 165 | 41.2 | 3.3 |
| Melanomas of the Skin | 5 | 1.4 | 0.6 | 11 | 2.9 | 0.9 |
| Breast | 0 | 0.0 | ~ | 80 | 18.6 | 2.2 |
| Cervix | 0 | 0.0 | ~ | 8 | 2.0 | 0.7 |
| Prostate | 73 | 21.3 | 2.5 | 0 | 0.0 | ~ |

~ Statistic could not be calculated.

# 5 Special Studies

This chapter contains three special studies:

- Cancer Incidence in Rhode Island Cities and Towns, 1987-2000
- Rhode Island Hispanics Have Mainstream Cancer Rates
- Problems in the Control of Melanoma of Skin, Rhode Island, 1987-1998

## 5.1 Cancer Incidence in Rhode Island Cities and Towns, 1987-2000

[John P. Fulton, Ph.D. and Leanne Chiaverini, B.S.]

### 5.1.1 Introduction

Since the recording of its first cancer case reports in October 1986 the Rhode Island Cancer Registry (RICR) of the Rhode Island Department of Health has been asked by various sources to produce cancer incidence rates for municipalities. Doing so requires at least ten years of cancer case reports and appropriate population data from censuses of the state's population. With the recent release of detailed demographic information for municipalities from the United States Census of 2000, it has become possible for the first time to produce cancer incidence rates for the 39 cities and towns of Rhode Island.

### 5.1.2 Methods

Counts of malignant neoplasms diagnosed between January 1, 1987, and December 31, 2000, categorized by age, sex, anatomical site, and municipality were prepared from cancer case reports made to the RICR. Municipality of residence at diagnosis was ascertained from three separate data fields: municipality, census tract, and zip code. Of 76,331 cases of malignant neoplasms diagnosed between January 1, 1987, and December 31, 2000, municipality of residence at diagnosis could be ascertained unambiguously in 97 percent. Another 0.2 percent included place names and corresponding zip codes that overlap more than one municipality. In these cases, the municipality identified as "primary" for the zip code by the United States Postal Service was selected for use, or absent this information, the largest municipality associated with the place. The remaining cases (slightly less than three percent) contained no useful information on municipality of residence at diagnosis. To avoid underestimating incidence rates, these cases were randomly assigned to municipalities in proportion to the estimated populations of the municipalities in 1994.

Counts of the Rhode Island population by age, sex, and municipality were obtained from publications of the 1990 and 2000 United States Censuses of Population.[1] Analogous counts were estimated for the years 1991-1999 by linear interpolation, and for the years 1987-1989 by linear projection, using data from the two censuses.

Age-adjusted sex-specific statewide and municipal cancer incidence rates were calculated from cancer case reports, actual and estimated counts of the Rhode Island population, and the Year 2000 United States Standard Population.[2] Rates were calculated for all cancers combined and for the four most common malignancies, cancers of the colon-rectum ("colon"), lung-bronchus ("lung"), prostate (males only), and breast (females only).

### 5.1.3 Results

The statewide age-adjusted cancer incidence rate for all cancers combined is 601.4 per 100,000 among males and 435.7 per 100,000 among females. (Table 5.1.1) By municipality, rates among males vary from 449.0 for Exeter to 726.1 for East Greenwich, with a standard deviation of 59.2 over the 39 cities and towns. (Table 5.1.1) Municipal cancer incidence rates for all cancers combined among females vary from 331.8 for Richmond to 512.4 for Hopkinton, with a standard deviation of 39.8 over the 39 cities and towns.

Measured relative to statewide incidence rates, the standard deviations of the municipal rates for all cancers combined were 9.8% for males and 9.1% for females. (Table 5.1.2) Municipal cancer incidence rates for the four most common site-specific cancers vary more widely over 39 cities and towns. Their standard deviations range from 15.8% to 22.6% of the corresponding statewide rates.

## 5.1.4 Discussion

Cancer is a major cause of morbidity and mortality in Rhode Island, as it is in the United States as a whole. About four out of every 10 people in Rhode Island will develop cancer sometime in the course of their lives, and half of them will die of the disease. Close to four percent of the state's population (nearly 40,000 people) suffer from cancer at any one time.

Cancer is considered a public health problem because some cancers are preventable, and others controllable, through environmental or population-based interventions. For this reason, the United States[3] and Rhode Island[4] both have established clearly articulated cancer control objectives for their populations.

Among the many different forms of cancer that beset humans, cancers of four anatomical sites clearly predominate in the United States: 1) cancer of the colon-rectum, 2) cancer of the lung, 3) cancer of the prostate (males), and 4) cancer of the breast (predominantly females). Of these four, the first two are largely preventable, and the last two are more easily controlled if identified as small tumors. For this reason, all four figure prominently in cancer control objectives, using population-based prevention and early detection strategies proven to be effective in research studies.[3,4]

The relative effect of proven cancer control interventions from place to place may be examined by comparing cancer incidence rates computed from cancer registry data. Examining differentials in cancer incidence rates by municipality, for example, may be helpful in targeting local cancer control interventions. For example, municipalities with high lung cancer incidence rates might consider targeting the reduction of tobacco use, while those with high colorectal incidence rates might consider ways of increasing the proportion of eligible persons receiving endoscopic exams of the colon. On the other hand, municipalities with low prostate cancer incidence rates or low breast cancer incidence rates might consider ways of promoting screening tests for these cancers.

A caution that should be observed in comparing rates across geographic entities with small populations is that random factors (factors unrelated to the cause of cancer or their control) are more likely to influence cancer incidence rates in smaller populations, where the numbers of cases are relatively small, than in larger populations. (Table 5.1.3) Nonetheless, when interpreted judiciously, municipal cancer rates serve as a good introduction to more comprehensive thinking about the factors that cause and reduce the cancer burden (incidence, prevalence, and mortality) across geographic areas.

## 5.1.5 References


1. Wu XC, Chen VW, Fulton JP, Hotes JL (eds). *Cancer in North America 1995-1999. Volume One: Incidence.* Springfield, IL: North American Association of Central Cancer Registries (in press).

2. United States Bureau of the Census. *American Fact Finder*. http://www.census.gov/

3. US Department of Health and Human Services. *Healthy People 2010: 2nd ed. Understanding and Improving Health and Objectives for Improving Health*. (2 vols.) Washington, DC: U.S. Government Printing Office. November 2000.

4. Rhode Island Department of Health. *Cancer Control Rhode Island: Strategic Plan for 1998-2005*. Providence, RI: Rhode Island Department of Health, 1998.


## 5.1.6 Tables

Table 5.1.1. Age-adjusted, sex-specific statewide and municipal cancer incidence rates per 100,000, RI, 1987-2000.

| | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|
| Municipality | Colon | Lung | Prostate | All* | Colon | Lung | Breast | All* |
| **State** | **82.6** | **105.8** | **153.0** | **601.4** | **56.4** | **54.3** | **130.6** | **435.7** |
| Barrington | 81.1 | 87.9 | 173.3 | 581.4 | 49.8 | 42.1 | 146.4 | 436.5 |
| Bristol | 79.3 | 101.0 | 143.5 | 576.6 | 49.2 | 36.5 | 129.7 | 375.7 |
| Burrillville | 89.9 | 110.9 | 146.1 | 556.4 | 61.2 | 42.8 | 113.6 | 383.8 |
| Central Falls | 83.3 | 147.5 | 117.4 | 621.4 | 55.0 | 59.0 | 101.7 | 398.4 |
| Charlestown | 51.9 | 82.8 | 224.7 | 629.9 | 46.8 | 75.5 | 138.9 | 472.3 |
| Coventry | 85.2 | 124.3 | 149.7 | 607.0 | 61.6 | 52.9 | 134.3 | 445.5 |
| Cranston | 86.1 | 100.6 | 142.1 | 592.1 | 56.5 | 52.3 | 135.1 | 431.0 |
| Cumberland | 76.9 | 81.9 | 161.1 | 545.6 | 66.0 | 42.5 | 135.2 | 429.2 |
| East Greenwich | 90.6 | 105.8 | 240.4 | 726.1 | 68.7 | 42.3 | 175.2 | 508.5 |
| East Providence | 82.8 | 109.1 | 146.5 | 591.7 | 62.1 | 49.8 | 127.1 | 438.6 |
| Exeter | 51.0 | 98.0 | 125.3 | 449.0 | 52.1 | 51.5 | 120.7 | 427.8 |
| Foster | 57.2 | 86.6 | 175.0 | 590.6 | 40.8 | 71.0 | 163.5 | 454.3 |
| Glocester | 43.2 | 73.6 | 129.1 | 449.3 | 44.1 | 52.6 | 96.8 | 354.8 |
| Hopkinton | 102.5 | 100.7 | 176.9 | 669.3 | 61.5 | 62.6 | 151.3 | 512.4 |
| Jamestown | 45.8 | 80.2 | 196.3 | 623.6 | 58.9 | 66.0 | 152.4 | 476.3 |
| Johnston | 85.4 | 113.6 | 140.0 | 604.2 | 58.5 | 56.0 | 147.1 | 468.6 |
| Lincoln | 79.2 | 90.1 | 150.1 | 567.5 | 49.2 | 36.3 | 114.9 | 365.0 |
| Little Compton | 65.2 | 108.1 | 169.5 | 587.2 | 29.2 | 39.7 | 141.1 | 422.0 |
| Middletown | 70.6 | 111.7 | 236.1 | 693.8 | 58.3 | 70.2 | 146.4 | 472.2 |
| Narragansett | 77.1 | 84.9 | 198.2 | 579.0 | 68.7 | 54.6 | 130.6 | 457.6 |
| New Shoreham | 20.8 | 81.9 | 188.3 | 636.6 | 0.0 | 60.4 | 174.3 | 394.0 |
| Newport | 76.4 | 107.3 | 247.6 | 716.6 | 58.3 | 72.4 | 139.9 | 480.9 |
| North Kingstown | 96.4 | 102.2 | 207.8 | 706.0 | 50.9 | 61.9 | 139.1 | 470.7 |
| North Providence | 89.4 | 103.0 | 124.9 | 594.2 | 51.1 | 56.1 | 131.8 | 425.0 |
| North Smithfield | 72.7 | 77.5 | 118.4 | 523.7 | 64.6 | 45.0 | 115.8 | 431.0 |
| Pawtucket | 94.5 | 113.1 | 130.8 | 605.0 | 55.7 | 52.7 | 123.2 | 428.1 |
| Portsmouth | 87.4 | 97.1 | 202.3 | 598.5 | 63.1 | 62.4 | 153.1 | 468.0 |
| Providence | 72.2 | 111.6 | 136.7 | 588.7 | 53.2 | 56.7 | 123.2 | 435.5 |
| Richmond | 89.6 | 102.0 | 178.5 | 671.3 | 47.9 | 64.4 | 75.2 | 331.8 |
| Scituate | 66.2 | 125.2 | 176.7 | 602.1 | 51.6 | 42.1 | 167.3 | 438.1 |
| Smithfield | 74.2 | 93.9 | 151.8 | 581.3 | 54.4 | 59.5 | 130.0 | 435.3 |
| South Kingstown | 67.9 | 99.5 | 187.0 | 608.0 | 56.0 | 57.0 | 149.4 | 447.6 |
| Tiverton | 76.1 | 84.0 | 149.4 | 531.3 | 49.2 | 46.3 | 104.1 | 377.2 |
| Warren | 82.1 | 98.7 | 137.5 | 575.7 | 53.4 | 59.1 | 130.6 | 427.0 |
| Warwick | 89.8 | 114.1 | 156.8 | 637.9 | 57.8 | 65.1 | 133.7 | 460.8 |
| West Greenwich | 91.2 | 137.3 | 182.0 | 637.6 | 46.6 | 93.6 | 109.5 | 475.5 |
| West Warwick | 103.8 | 125.3 | 144.1 | 649.9 | 57.1 | 59.7 | 123.3 | 440.5 |
| Westerly | 78.5 | 89.7 | 174.0 | 625.1 | 61.1 | 46.8 | 127.3 | 433.7 |
| Woonsocket | 102.6 | 121.0 | 125.5 | 608.7 | 59.1 | 53.0 | 119.2 | 425.0 |

Note: Rates are average annual, age-standardized, using the 2000 U.S. population as standard, expressed as newly diagnosed cases per 100,000 population.

* All cancers combined

Table 5.1.2. Statewide cancer incidence rates per 100,000 and standard deviations of municipal rates, RI, 1987-2000.

| Site | Males | | | Females | | |
|---|---|---|---|---|---|---|
| | Statewide Rate | Standard Deviation | SD as % of State Rate | Statewide Rate | Standard Deviation | SD as % of State Rate |
| Colon | 82.6 | 17.5 | 21.1% | 56.4 | 11.8 | 20.8% |
| Lung | 105.8 | 16.7 | 15.8% | 54.3 | 11.8 | 21.8% |
| Prostate | 153.0 | 34.6 | 22.6% | -- | -- | -- |
| Breast | -- | -- | -- | 130.6 | 20.8 | 15.9% |
| All* | 601.4 | 59.2 | 9.8% | 435.7 | 39.8 | 9.1% |

Note: Rates are average annual, age-standardized, using the 2000 U.S. population as standard, expressed as newly diagnosed cases per 100,000 population.

* All cancers combined

Table 5.1.3. Statewide and municipal cases of diagnosed cancer, RI, 1987-2000.

| | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|
| Municipality | Colon | Lung | Prostate | All* | Colon | Lung | Breast | All* |
| **State** | **5132** | **6820** | **9849** | **38346** | **5420** | **4793** | **10881** | **37981** |
| Barrington | 88 | 95 | 185 | 623 | 68 | 59 | 196 | 587 |
| Bristol | 122 | 167 | 244 | 936 | 108 | 74 | 231 | 720 |
| Burrillville | 75 | 94 | 120 | 473 | 80 | 49 | 128 | 454 |
| Central Falls | 76 | 137 | 106 | 576 | 93 | 84 | 144 | 579 |
| Charlestown | 24 | 41 | 110 | 305 | 26 | 44 | 75 | 256 |
| Coventry | 151 | 232 | 274 | 1121 | 163 | 136 | 336 | 1132 |
| Cranston | 472 | 561 | 814 | 3291 | 491 | 396 | 979 | 3280 |
| Cumberland | 149 | 171 | 322 | 1086 | 191 | 121 | 353 | 1157 |
| East Greenwich | 67 | 76 | 173 | 535 | 71 | 42 | 177 | 517 |
| East Providence | 296 | 404 | 543 | 2125 | 376 | 266 | 626 | 2302 |
| Exeter | 13 | 28 | 33 | 131 | 18 | 18 | 41 | 148 |
| Foster | 13 | 19 | 42 | 141 | 12 | 18 | 48 | 129 |
| Glocester | 20 | 41 | 56 | 217 | 23 | 29 | 61 | 208 |
| Hopkinton | 37 | 42 | 66 | 262 | 31 | 31 | 75 | 255 |
| Jamestown | 14 | 30 | 73 | 216 | 26 | 29 | 66 | 205 |
| Johnston | 166 | 229 | 285 | 1195 | 176 | 149 | 372 | 1248 |
| Lincoln | 109 | 131 | 218 | 803 | 102 | 72 | 198 | 672 |
| Little Compton | 18 | 28 | 48 | 159 | 10 | 14 | 43 | 132 |
| Middletown | 68 | 113 | 236 | 702 | 96 | 101 | 201 | 680 |
| Narragansett | 66 | 75 | 174 | 517 | 73 | 62 | 139 | 496 |
| New Shoreham | 2 | 6 | 14 | 45 | 0 | 6 | 13 | 31 |
| Newport | 111 | 158 | 361 | 1064 | 141 | 161 | 285 | 1043 |
| North Kingstown | 127 | 143 | 281 | 972 | 96 | 116 | 260 | 882 |
| North Providence | 220 | 259 | 317 | 1458 | 196 | 195 | 429 | 1440 |
| North Smithfield | 56 | 60 | 93 | 406 | 79 | 46 | 114 | 453 |
| Pawtucket | 427 | 518 | 607 | 2760 | 406 | 353 | 761 | 2777 |
| Portsmouth | 83 | 105 | 200 | 611 | 81 | 83 | 199 | 609 |
| Providence | 585 | 911 | 1127 | 4860 | 717 | 668 | 1394 | 5238 |
| Richmond | 23 | 30 | 47 | 177 | 14 | 17 | 27 | 107 |
| Scituate | 42 | 78 | 111 | 382 | 37 | 31 | 122 | 318 |
| Smithfield | 87 | 112 | 178 | 687 | 105 | 99 | 203 | 728 |
| South Kingstown | 90 | 135 | 252 | 820 | 105 | 97 | 253 | 781 |
| Tiverton | 82 | 89 | 158 | 563 | 64 | 61 | 133 | 481 |
| Warren | 66 | 82 | 116 | 474 | 68 | 67 | 138 | 477 |
| Warwick | 515 | 698 | 949 | 3788 | 518 | 549 | 1058 | 3775 |
| West Greenwich | 16 | 25 | 32 | 123 | 8 | 19 | 31 | 112 |
| West Warwick | 170 | 233 | 258 | 1144 | 145 | 144 | 281 | 1053 |
| Westerly | 120 | 139 | 281 | 976 | 141 | 96 | 239 | 876 |
| Woonsocket | 266 | 325 | 345 | 1622 | 265 | 191 | 452 | 1643 |

* All cancers combined

## 5.2 Rhode Island Hispanics Have Mainstream Cancer Rates

[John P. Fulton, Ph.D. and Jay S. Buechner, Ph.D.]

### 5.2.1 Introduction

The 2000 U.S. Census enumerated more than 85,000 persons in Rhode Island who self-identified as Hispanic, representing about 8.5 percent of the state's total population and comprising the state's largest racial or ethnic minority group. Producing regular health statistics for Hispanics is challenging because ethnicity is difficult to measure in health surveillance systems of even the best design. Here we have evaluated the ability of two major surveillance systems, the Rhode Island Cancer Registry and the Vital Records death certificate file, to measure cancer morbidity and mortality among resident Hispanics.

### 5.2.2 Methods

Because Census Bureau inter-censal estimates of the number of resident Rhode Island Hispanics were inconsistent with counts from the 2000 U.S. Census, new inter-censal estimates were constructed for resident Rhode Island Hispanics by year, sex, and age group for the years 1989-1998, using linear interpolation and extrapolation from 1990 and 2000 Census counts.

Data on resident cancer cases and deaths identified as Hispanic were extracted from Cancer Registry case reports and from Vital Records death certificates for the ten years 1989-1998 and aggregated by age group, sex, and year of event.

Alternative counts of cases and deaths for resident Rhode Island Hispanics were estimated using a validated U.S. Census technique for identifying Hispanics by surname.[1] For resident males, data on surname from cancer case reports and from death certificates with cancer as the cause of death for the years 1989-1998 were searched for any of "639 most frequently occurring heavily Hispanic surnames" identified by the Bureau of the Census. ("Heavily Hispanic" means that 75 percent or more of the people with a particular surname self-identified as Hispanic on the survey.) For resident females, data on father's surname from death certificates with cancer as the cause of death for the years 1989-1998 were searched for any of the 639 names. (Data on father's surname are not available on Rhode Island Cancer Registry case reports.)

Synthetic aggregates of Hispanic cancer cases and cancer deaths were created by adding the additional cases and deaths classified as Hispanic on the basis of the surname analysis to those deaths identified as Hispanic in case reports and on death certificates. These estimates were combined with the estimates of the Hispanic population of Rhode Island for 1989-1998 to construct age-adjusted cancer incidence rates (males only) and age-adjusted cancer mortality rates (males and females). The year 2000 standard U.S. population was used for age-adjustment.

The synthetic aggregates of Hispanic cancer cases were also used to examine the proportion of cancer cases by anatomic site, comparing them with similar data for the Rhode Island population as a whole.

### 5.2.3 Results

Over the ten-year period examined, a total of 507 diagnosed cases of cancer were identified among Hispanic males, identified either from case reports or from the surname analysis. Of these, 224 (44.2%) were identified from case reports, and an additional 283 (55.8%) were identified only by Hispanic surname. By year, aggregation of cases from the two methods more than doubled the number of cases originally reported to the Cancer Registry as Hispanic in the first eight years of observation, and enhanced case counts substantially in 1997 and 1998 as well. (Table 5.2.1) The number of cancer deaths among Hispanic males and females during this period showed similar enhancements from the surname analysis.

Table 5.2.2 presents age-adjusted cancer incidence and mortality rates for resident Rhode Island Hispanic males and age-adjusted cancer mortality rates for resident Rhode Island Hispanic females in 1989-1993 and in 1994-1998, along with comparable rates for the state as a whole. In all comparisons, Hispanics have age-adjusted cancer rates that fall near but below age-adjusted cancer rates for the state as a whole.

The three most frequently occurring cancers by anatomical site during 1994-1998 were the same for Hispanic males in Rhode Island as for all males: Prostate; lung and bronchus; and colon and rectum. (Table 5.2.3) Among other major cancer sites, resident Hispanic males were more likely than resident males overall to develop cancers of the stomach and liver and leukemias, and less likely than resident males overall to develop cancer of lung and bronchus and of the urinary bladder. Patterns for the period 1989-1993 were similar.

### 5.2.4 Discussion

This analysis of data on cancer incidence and mortality among Hispanic Rhode Island residents supports conclusions concerning both patterns of disease and the reliability of the underlying data.

- The use of an authoritative list of Hispanic surnames to augment Hispanic origin information on cancer registry case reports and death certificates approximately doubles the number of cancer cases that are presumably Hispanic in each of the two databases. Thus, these reporting systems are substantially understating the extent of cancer in this population.

- Based on the rates produced from the synthetic aggregates, Hispanic cancer rates are generally similar to statewide cancer rates for all sites.

- The site distribution for cancer incidence among male Hispanics follows the statewide distribution with two divergences worth noting. The observed higher proportions of stomach and liver cancers may be linked to the dietary patterns and infectious disease patterns (e.g., Hepatitis B) in developing countries and in immigrants from those countries. The high proportion of leukemias is consistent with a population whose age distribution is heavily weighted towards the very young.

Healthy People 2010 set a national goal of eliminating health disparities, in particular among disadvantaged racial and ethnic populations.[2] To support the accomplishment of this sweeping goal, public health surveillance data must have accurate and consistent reporting of race and ethnicity. The Rhode Island Department of Health has recently revised its policy on the collection of data on race and ethnicity and intends to improve the quality of the collected data as the changes in policy are implemented.[3] The findings of this analysis show the clear need for such quality improvement efforts.

### 5.2.5 References


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5.2.6 Tables

Table 5.2.1. Number of all newly diagnosed cancers, by source and year, resident RI Hispanic males

| Year | Either Source | Surname Analysis | Cancer Registry |
|---|---|---|---|
| 1989 | 41 | 30 | 21 |
| 1990 | 41 | 35 | 16 |
| 1991 | 44 | 36 | 20 |
| 1992 | 56 | 51 | 10 |
| 1993 | 39 | 34 | 14 |
| 1994 | 40 | 31 | 17 |
| 1995 | 54 | 46 | 18 |
| 1996 | 55 | 40 | 28 |
| 1997 | 61 | 46 | 36 |
| 1998 | 76 | 51 | 44 |

Table 5.2.2. Age-adjusted cancer rates, all cancers combined, by sex and period, RI, Hispanics versus all residents

| | | | ---------- Age-Adjusted Rate ---------- | |
|---|---|---|---|---|
| Type of Rate | Sex | Period | Hispanics | All Residents |
| Incidence | Male | 1989-1993 | 506.5 | 589.5 |
| Incidence | Male | 1994-1998 | 535.5 | 634.0 |
| Mortality | Male | 1989-1993 | 240.3 | 295.4 |
| Mortality | Male | 1994-1998 | 180.8 | 282.3 |
| Mortality | Female | 1989-1993 | 143.3 | 184.4 |
| Mortality | Female | 1994-1998 | 125.6 | 181.1 |

Note: Rates are average annual, age-standardized, using the 2000 U.S. population as standard, expressed as newly diagnosed cases or deaths per 100,000 population.

Table 5.2.3. Percentage of all newly diagnosed cancers, by anatomic site and year, RI, Hispanic males versus all resident males

| | | --------- Percentage of Newly Diagnosed Cancers --------- | |
|---|---|---|---|
| Year | Anatomic Site | Hispanic Males | All Resident Males |
| 1989-1993 | Prostate | 22.6 | 25.8 |
| 1989-1993 | Lung and Bronchus | 16.3 | 18.5 |
| 1989-1993 | Colon and Rectum | 15.4 | 14.2 |
| 1989-1993 | Leukemias | 8.1 | 2.7 |
| 1989-1993 | Stomach | 6.8 | 2.6 |
| 1989-1993 | Lymphomas | 5.4 | 4.5 |
| 1989-1993 | Urinary Bladder | 4.1 | 7.2 |
| 1989-1993 | Liver | 2.3 | 0.9 |
| 1989-1993 | Pancreas | 2.3 | 2.0 |
| 1989-1993 | Brain | 2.3 | 1.4 |
| 1994-1998 | Prostate | 24.8 | 26.9 |
| 1994-1998 | Lung and Bronchus | 12.6 | 17.3 |
| 1994-1998 | Colon and Rectum | 9.7 | 12.1 |
| 1994-1998 | Leukemias | 7.3 | 2.7 |
| 1994-1998 | Stomach | 7.0 | 2.4 |
| 1994-1998 | Lymphomas | 5.6 | 4.7 |
| 1994-1998 | Urinary Bladder | 2.1 | 7.9 |
| 1994-1998 | Liver | 4.2 | 0.9 |
| 1994-1998 | Pancreas | 1.7 | 2.2 |
| 1994-1998 | Brain | 2.8 | 1.4 |

## 5.3 Problems in the Control of Melanoma of Skin, Rhode Island, 1987-1998

[John P. Fulton, Ph.D.]

### 5.3.1 Introduction

Melanoma of the skin (Melanoma) is a serious disease in the United States. About 48,000 new melanomas are diagnosed annually, and about 8,000 people die of the disease. (1) The five year survival rate for melanoma diagnosed at all stages is about 89 percent, but cases that present as regional or distant tumors have five year survival rates of 61 percent and 12 percent, respectively. (2) Age-adjusted melanoma incidence almost tripled between 1973, when national cancer incidence statistics were first collected, and 1998, the last year for which incidence data are currently available. Mortality also increased between 1973 and 1998, but less dramatically. (2) Melanoma incidence is largely confined to the white population in this country. Blacks so rarely get Melanoma that incidence rates cannot be calculated for most years. (2)

### 5.3.2 Methods

Data on newly diagnosed cases of malignant melanoma of the skin for Rhode Island residents, 1987-1998, were obtained from the Rhode Island Cancer Registry. Analogous data on deaths from malignant melanoma were obtained from the Office of Vital Records, Rhode Island Department of Health. A quick check indicated that over 99 percent of the cases and deaths were attributed to whites. Further analysis was therefore restricted to whites. Age-specific incidence and mortality rates, by sex, were computed for the entire period, 1987-1998, by combining data on cases and deaths with intercensal estimates of the population of Rhode Island by age, sex, and race prepared by the United States Bureau of the Census. Age-specific rates were then combined with the United States Standard Population of 1970 to construct age-adjusted incidence and mortality rates by sex and by year of diagnosis or death. Use of the United States Standard Population of 1970 is the current convention for the calculation of cancer statistics in the United States. (2) Years of diagnosis or death were grouped to smooth the rates (1987-1990, 1991-1994, 1995-1998). The percentage of new cases diagnosed at each stage was also computed for these three time periods.

To facilitate comparison with the latest available national data on melanoma incidence and mortality, age-adjusted Rhode Island rates were also constructed for the 1994-1998 period, using the United States Standard Population of 1970. Comparable national data were obtained from the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) system. The SEER system covers about 14 percent of the United States population, but that 14 percent has been carefully selected to allow the constuction of rates which are representative of the nation as a whole. (2)

To test the completeness of malignant melanoma case reporting to the Rhode Island Cancer Registry, an incidence-to-mortality rate ratio was computed from Rhode Island's age-adjusted melanoma incidence and mortality rates for 1994-1998, and compared with the analogous rate ratio computed from SEER rates for the same period. Use of the incidence-to-mortality rate ratio to evaluate completeness of case reporting is standard practice among central cancer registries in the United States. (3) The Rhode Island ratio (6.7) is nominally higher than the national ratio (6.4), indicating that the Rhode Island cases have not been grossly undercounted.

Finally, the percentage distribution of new cases of melanoma among Rhode Island residents by stage of disease at diagnosis was calculated for 1987-1990, 1991-1994, and 1995-1998.

### 5.3.3 Results

Over the course of twelve years (1987-1998), 1692 newly diagnosed melanomas and 326 melanoma deaths were reported for white Rhode Island residents. The mean and median ages at diagnosis were both 61. The mean and median ages at death were 73 and 76, respectively.

In that time period (1987-1998), age-specific melanoma incidence and mortality rates were generally higher for males than females, with greater differentials observed in the upper age groups. (Tables 5.3.1 and 5.32) Age-adjusted melanoma incidence and mortality rates were also higher for males than females. In the period 1995-1998, for example, the age-adjusted melanoma incidence rate for males, 18.8 per 100,000, was 65 percent higher than the analogous rate for females, 11.4 per 100,000. In the same period, the age-adjusted melanoma mortality rate for males, 3.0 per 100,000, was 76 percent higher than the analogous rate for females, 1.7 per 100,000. Age-adjusted

incidence increased for both males and females throughout the period of observation, as did age-adjusted mortality for females. For males, a recent increase in age-adjusted mortality followed an earlier decline. (Tables 5.3.3 and 5.3.4)

Focusing on the five latest years for which completed incidence and mortality data are available, age-adjusted melanoma incidence and mortality rates for both sexes are lower in Rhode Island than in the United States as a whole. Among males, for example, the incidence rate is 17.9 per 100,000 in Rhode Island, versus 19.6 in the United States. The parallel rates for females are 11.3 and 13.5, respectively. The age-adjusted melanoma mortality rate for males is 2.8 per 100,000 in Rhode Island, versus 3.6 in the United States. For females, the age-adjusted melanoma mortality rate is 1.6 in Rhode Island, versus 1.7 in the United States as a whole.

The proportion of cases for which the stage of disease was unknown at the time of case reporting increased over the period of observation, from 21 percent in 1987-1990 to 30 percent in 1991-1994 to 34 percent in 1995-1998. This increase mirrored a decrease in the proportion of cases staged as "localized" at the time of case reporting.

### 5.3.4 Discussion

Common risk factors for melanoma of skin include sunlight exposure and sunburn, fair skin, mole characteristics (type and number), and family history. A relationship between melanoma mortality and latitude has been observed in the United States, which probably accounts for the differential observed between Rhode Island and the United States as a whole. (4)

The increase in melanoma incidence and mortality observed in Rhode Island and elsewhere in the United States is troubling. In short, control efforts (prevention, screening, and treatment) appear to be failing. We must increase our efforts to educate the public to protect themselves from melanoma by avoiding sunburn and excess sun exposure, and by seeking care for moles that are "persistently changed or changing." (4) Referring high-risk patients to dermatologists for regular check-ups is also a prudent control measure for this potentially deadly disease. (5) Finally, we must work to reduce the proportion of melanomas reported with "unknown" stage of disease at diagnosis. The increase in the proportion of unknowns since 1987 is an artifact of case reporting procedures and the increased proportion of melanoma cases that are first treated in an outpatient setting. Staff of the Rhode Island Cancer Registry will work with hospital cancer registrars throughout the state to solve this problem.

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5.3.6 Tables

Table 5.3.1. Age-specific incidence of melanoma of skin, RI, whites, 1987-1998, by sex

| Age Group | Male | Female |
|---|---|---|
| 00-09 | 0.2 | 0.2 |
| 10-19 | 0.7 | 1.3 |
| 20-29 | 3.4 | 4.7 |
| 30-39 | 10.9 | 10.9 |
| 40-49 | 19.8 | 19.3 |
| 50-59 | 34.3 | 18.6 |
| 60-69 | 46.8 | 22.5 |
| 70-79 | 60.4 | 25.5 |
| 80+ | 82.0 | 27.9 |

Note: Rates are expressed as average annual newly diagnosed cases per 100,000 population.

Table 5.3.2. Age-specific mortality of melanoma of skin, RI, whites, 1987-1998, by sex

| Age Group | Male | Female |
|---|---|---|
| 00-09 | 0.0 | 0.0 |
| 10-19 | 0.0 | 0.1 |
| 20-29 | 0.2 | 0.3 |
| 30-39 | 1.4 | 1.3 |
| 40-49 | 3.4 | 1.3 |
| 50-59 | 5.3 | 3.1 |
| 60-69 | 10.0 | 3.9 |
| 70-79 | 13.3 | 5.7 |
| 80+ | 26.8 | 13.1 |

Note: Rates are expressed as newly diagnosed deaths per 100,000 population.

Table 5.3.3. Age-adjusted incidence of melanoma of skin, RI, whites, 1987-1998, by sex and time period

| Time Period | Male | Female |
|---|---|---|
| 1987-1990 | 12.7 | 7.7 |
| 1991-1994 | 15.5 | 10.3 |
| 1995-1998 | 18.8 | 11.4 |

Note: Rates are average annual, age-standardized, using the 1970 U.S. population as standard, expressed as newly diagnosed cases per 100,000 population.

Table 5.3.4. Age-adjusted mortality of melanoma of skin, RI, whites, 1987-1998, by sex and time period

| Time Period | Male | Female |
|---|---|---|
| 1987-1990 | 3.4 | 1.3 |
| 1991-1994 | 2.7 | 1.4 |
| 1995-1998 | 3.0 | 1.7 |

Note: Rates are average annual, age-standardized, using the 1970 U.S. population as standard, expressed as deaths per 100,000 population.

# 6 Cancer in Rhode Island: Common Questions, Simple Answers

[John P. Fulton, PhD]

## 6.1 Introduction

Since its inception in 1986, the Rhode Island Cancer Registry, a subdivision of the Rhode Island Department of Health, has received and answered many questions about cancer from an interested and concerned public. The most common questions are presented here, with simple answers, stripped of jargon and complex statistics.

## 6.2 Questions and Answers

*Are cancer rates higher in Rhode Island than in the rest of the country?*

Yes, cancer rates are higher in Rhode Island than in the country as a whole. Among the states, Rhode Island does not have the highest cancer rates, although its rates are higher than many states.

*Are all cancers more common in Rhode Island than in the rest of the country?*

No. Most cancer rates are about the same in Rhode Island as in the rest of the United States. However, the most common cancers, including cancers of the lung, colon-rectum, breast, prostate, and bladder, are more common in Rhode Island than in the country as a whole.

*Why does Rhode Island have high cancer rates?*

Rhode Island is not unique. It has what is called an "urban cancer profile." Its cancer rates are similar to other highly urbanized states and to many cities. In more urban places, the most common cancers, including cancers of the lung, colon-rectum, breast, prostate, and bladder have higher rates than are found in less urban places.

It is believed, on the basis of scientific evidence, that the most common cancers have higher rates in more urban places than less urban places because of lifestyle differences related to cancer. For example, on average, people who live in more urban places may smoke more, eat fattier diets, and get less exercise than people who live in less urban places.

*I want to move to Rhode Island, but I don't want to get cancer. What places should I avoid?*

Rhode Island's higher-than-average cancer rates are not caused by environmental exposures such as polluted air and water. There are no residential neighborhoods in Rhode Island to avoid because of cancer. However, if you are building a house, you probably want to avoid old industrial sites which may have been contaminated before proper environmental controls were put into effect. Know and understand the prior uses of a piece of property before purchasing it.

*Why can't I find cancer statistics for my town? My neighborhood?*

Cancer rates for small areas like towns and neighborhoods are misleading. Many cancers are caused by lifestyle factors, like smoking, that have nothing to do with the towns or neighborhoods in which they occur. Other cancers are actually "moved" into towns or neighborhoods when people who have cancer move there. Still other cancers may be caused by occupational exposures occurring in other towns. Small area cancer statistics are regularly computed to investigate public health concerns. To date, such statistics have not uncovered environmental causes of cancers in small areas of Rhode Island.

*I have noticed many cases of cancer in my neighborhood. What's going on*?

Cancer is a common illness in Rhode Island and the country as a whole. In Rhode Island, about 2000 out of every 10,000 deaths are caused by cancer. About 3000 out of every 10,000 death certificates contain some

mention of cancer. About 4000 out of every 10,000 people will develop cancer sometime in the course of their lives.

Cancer occurs much more commonly among older adults than among younger adults and children. People who live in neighborhoods where many older adults live will notice many cases of cancer over time.

*I live (or work) close to high tension power lines. Do they cause cancer?*

Power lines may or may not cause cancer. Some studies apparently demonstrate a relationship between exposure to power lines and the development of cancer. Other studies do not. If there is any relationship, it is probably a very weak one. In the United States, trends in power use are apparently not related to trends in cancer. The jury is still out on this one, but don't lose much sleep over it.

*What can I do to avoid cancer-causing environmental hazards in my home?*

Do not smoke or allow smoking in your home. Do not allow smaller children to pump or to use gasoline. Make sure that everyone else in the family knows how to avoid exposure to gasoline when they use it. Test your house for radon. Have your well water tested for chemical contaminants. Avoid the use of pesticides as much as possible. If you need to use strong pesticides, consider having them applied by professionals who know how to protect themselves and your family from unhealthy exposures. If you own a home that contains asbestos building materials, have them inspected by professionals for advice on safety, maintenance, and safe removal; do not remove them yourself. Keep your home well ventilated all year long.

*Why are breast cancer rates going up?*

Breast cancer rates are going up mainly because more and more women are getting screening mammograms, and as a result, breast cancers are being found earlier than in the past.

*Why are prostate cancer rates going up?*

Prostate cancer rates are going up mainly because more and more men are getting the PSA test, and as a result, prostate cancers are being found earlier than in the past.

*What cancers can be prevented?*

Many cancers can be prevented by avoiding tobacco products and second hand smoke. Lung cancer is the best known example, but tobacco use also causes cancers of the oral cavity, pharynx, larynx, esophagus, trachea, bronchus, kidney, bladder, and pancreas.

Many cancers of the cervix and colon-rectum may be prevented by getting screened according to current guidelines. The Pap test is able to detect lesions of the cervix before they are cancerous, allowing their removal before cancer develops. Similarly, sigmoidoscopy and colonoscopy are able to detect lesions of the colon and rectum before they are cancerous, allowing their removal before cancer develops.

*What is a clinical trial? I don't want to be a guinea pig.*

A clinical trial is good medicine. The "control group" in a clinical trial gets the best known treatment for the cancer in question. The "treatment group" gets similar, high-quality treatment with an improvement that has shown promise in the laboratory.

*I don't have health insurance. Where can I get screened for cancer?*

The best advice we can give is to seek proper primary medical care from one of the many community health centers in the state. The medical care providers there will work to provide you with the most appropriate cancer screening tests for someone of your age, sex, and family history.